



# GRASI

Gulf Regional Airspace Strategic Initiative



Eglin Air Force Base, Florida



## LANDSCAPE INITIATIVE

### ENVIRONMENTAL IMPACT STATEMENT





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## COVER SHEET

### GULF REGIONAL AIRSPACE STRATEGIC INITIATIVE (GRASI) LANDSCAPE INITIATIVE ENVIRONMENTAL IMPACT STATEMENT

**a. Responsible Agency:** U.S. Air Force, 96th Test Wing (96 TW) – Eglin Air Force Base (AFB), Florida, in coordination with the Florida Forest Service (FFS).

**b. Cooperating Agencies:** Not Applicable

**c. Proposals and Actions:** This Environmental Impact Statement (EIS) describes the potential consequences to the human and natural environment that would result from the Proposed Action or Subalternative of the Proposed Action to implement the Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative (GLI) training and emitter site activities in the region of northwest Florida. The GRASI is a United States (U.S.) Air Force-led partnership with state and federal agencies to expand the capacity of the region to safely host military test and training operations. The GLI involves partnerships with other agencies willing to support DoD training on their lands when training capacity on existing military ranges is unavailable. Specifically this EIS addresses current established partnerships with the State of Florida and locations in the Blackwater River and Tate's Hell State Forests for general training operations and small, noncontiguous land areas throughout the region for permanent and mobile radar emitter sites. Other GLI partner lands may be evaluated in the future as new partnerships are established.

**d. Comments and Inquiries:** Written comments on this document should be directed to Mr. Mike Spaits, Eglin AFB Public Affairs Office, 96 TW/PA, 101 West D Avenue, Room 238, Eglin AFB, FL 32542-5499, (850) 882-2836, or michael.spaits@us.af.mil. Comments may also be submitted electronically at <http://grasieis.leidoseemg.com>; additional information on the GLI EIS may also be found at this website. To ensure the Air Force has sufficient time to include public input in the Record of Decision, written comments from the public should be submitted by July 6, 2015.

**e. Designation:** Final Environmental Impact Statement

**f. Abstract:** This EIS has been prepared in accordance with the National Environmental Policy Act (NEPA) to analyze the potential environmental consequences of the proposed GLI at Eglin AFB, Florida, and the No Action Alternative. The Proposed Action consists of two main components: obtaining necessary permits to use (1) emitter training sites and (2) areas of northwest Florida state forests for nonhazardous training activities. Training activities would involve some minor land disturbance (no land development), use of wheeled vehicles on established roads only, dismounted troop movements, helicopter and light aviation landings on established landing zones (existing roads and cleared areas), and use of blank ammunition in select areas. Subalternative 1 is a subset of these activities on a smaller scale. Subalternative 1 was developed by the Air Force to minimize impacts and to respond to public concerns expressed about the implementation of the Proposed Action. Use of the forests would be accomplished through lease agreements with the FFS, and would initially occur a few times annually, with frequency increasing as the program becomes more established. All training would be conducted in conformance with FFS forest management plans. This EIS analyzes potential impacts associated with airspace, noise, land use, socioeconomics and environmental justice, transportation, utilities, air quality, safety, solid waste, hazardous materials and hazardous waste, physical resources, biological resources, and cultural resources. This EIS also identifies mitigations and best management practices (BMPs) that the proponent could implement to minimize or offset potential adverse impacts.

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## HOW TO USE THIS DOCUMENT

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Click on [hyperlinks](#) to jump to an element, and hold down the “Alt” key while pressing the “left-arrow” key to GO BACK.



JUMP to a table, figure, or section by clicking on any “[hyperlink](#)” to it.

Go BACK to the page you jumped from, by holding down the “Alt” key while pressing the “left-arrow” key on the keyboard.



- **The Executive Summary** provides a summary of information in this EIS.
- **Chapter [1](#), Purpose and Need**, explains why the proposed action is needed.
- **Chapter [2](#), Description of the Proposed Action and Alternatives**, describes what activities and alternatives are involved.
- **Chapter [3](#), Affected Resource Assessment**, identifies what could be affected by the proposed action and talks about regulations and how we assess impacts.
- **Chapter [4](#), Emitter Sites Affected Environment/Environmental Consequences**, describes the possible effects near proposed emitter sites.
- **Chapter [5](#), Blackwater River State Forest Affected Environment/Environmental Consequences**, focuses on activities within Blackwater River State Forest.
- **Chapter [6](#), Tate’s Hell State Forest Affected Environment/Environmental Consequences**, focuses on activities within Tate’s Hell State Forest.
- **Chapter [7](#), Cumulative Impacts**, talks about potential cumulative impacts when combining the proposed action with past, present, and reasonably foreseeable future actions.
- **Chapter [8](#), No Action Alternative Impact Analysis**, describes the potential impacts from not implementing the proposed action.
- **Chapter [9](#), Other NEPA Considerations**, compares the proposed short-term use of the environment and resources with their long-term productivity, and describes the commitment of nonrenewable resources, energy requirements and conservation potential of proposed alternatives and mitigation measures, as well as requirements for natural or depletable resources and the potential to conserve environmental resources.
- Chapter [10](#) includes a bibliography; Chapter [11](#) has a list of preparers; Chapter [12](#) is an index, and Chapter [0](#) provides a short glossary.

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## EXECUTIVE SUMMARY

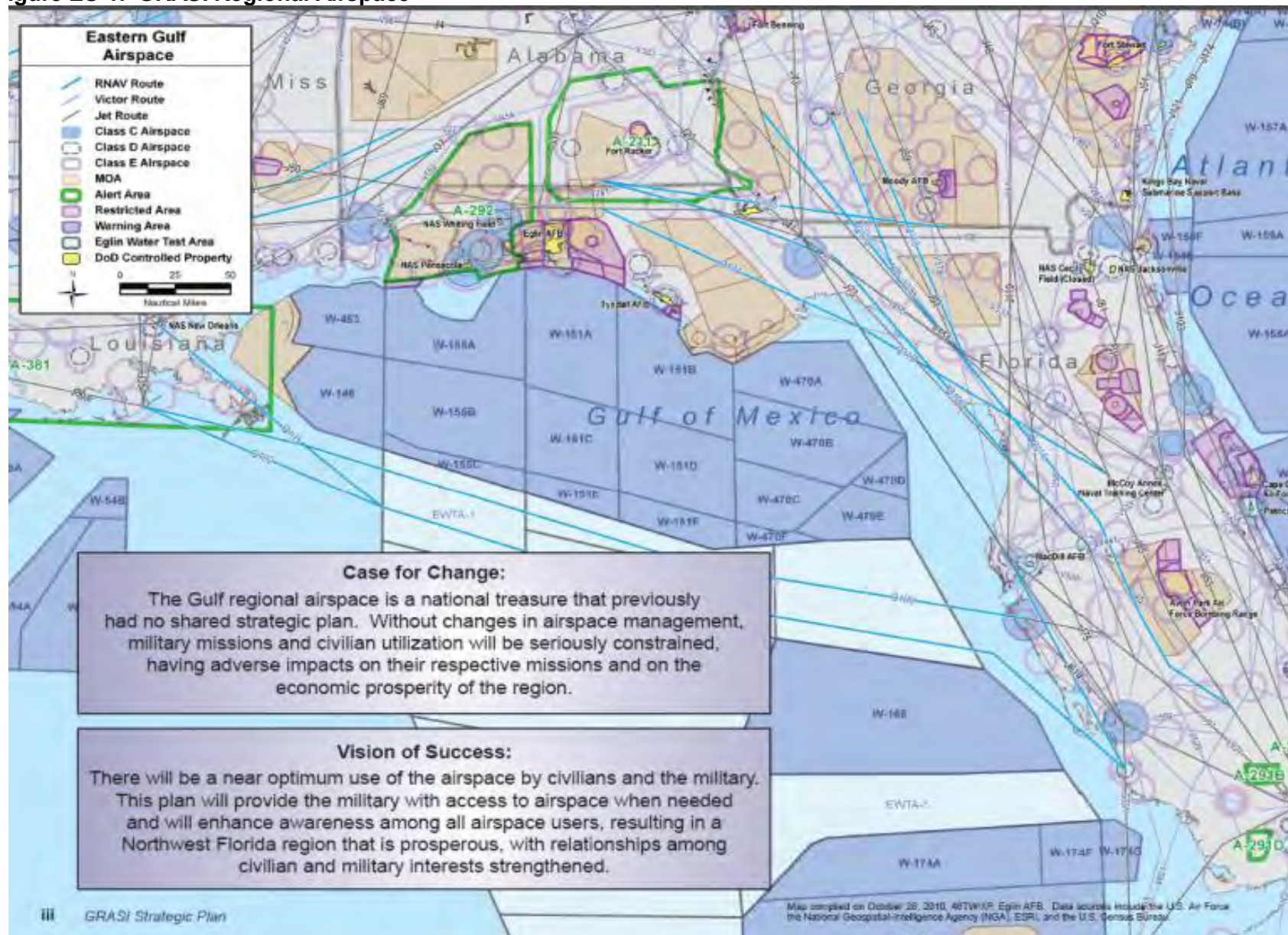
The Gulf Regional Airspace Strategic Initiative (GRASI) region (Figure ES-1) consists of the eastern Gulf of Mexico region, which includes northwest Florida, southern Mississippi, lower Alabama, southern Georgia, and the eastern Gulf of Mexico. The GRASI is a collaborative planning effort between military and civilian leaders designed to ensure the future availability and capacity of regional airspace and training lands for military use and the continued economic prosperity of the Gulf coast. The entire GRASI planning process, goals, objectives, and strategies are in the *GRASI Strategic Plan*, at <http://grasi.leidoseemg.com>.

This Environmental Impact Statement (EIS) examines the potential environmental impacts resulting from the implementation of the Proposed Action and associated Subalternative. The Proposed Action is the implementation of the GRASI Landscape Initiative (GLI) in the region of northwest Florida. The GLI is a U.S. Air Force-led partnership with the State of Florida to provide military units with compatible locations that can serve as an outlet for training activities when they are otherwise unable to meet their requirements using current military training areas. Specifically, this EIS addresses locations in the Blackwater River State Forest (BRSF) and Tate's Hell State Forest (THSF) (Figure ES-2) for general training operations, as well as small, noncontiguous land areas throughout the region for permanent and mobile radar emitter sites. The Subalternative addressed in this EIS is a subset of activities associated with the Proposed Action; the Subalternative is a "smaller-scale" version of the Proposed Action.

### ES.1. ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP)

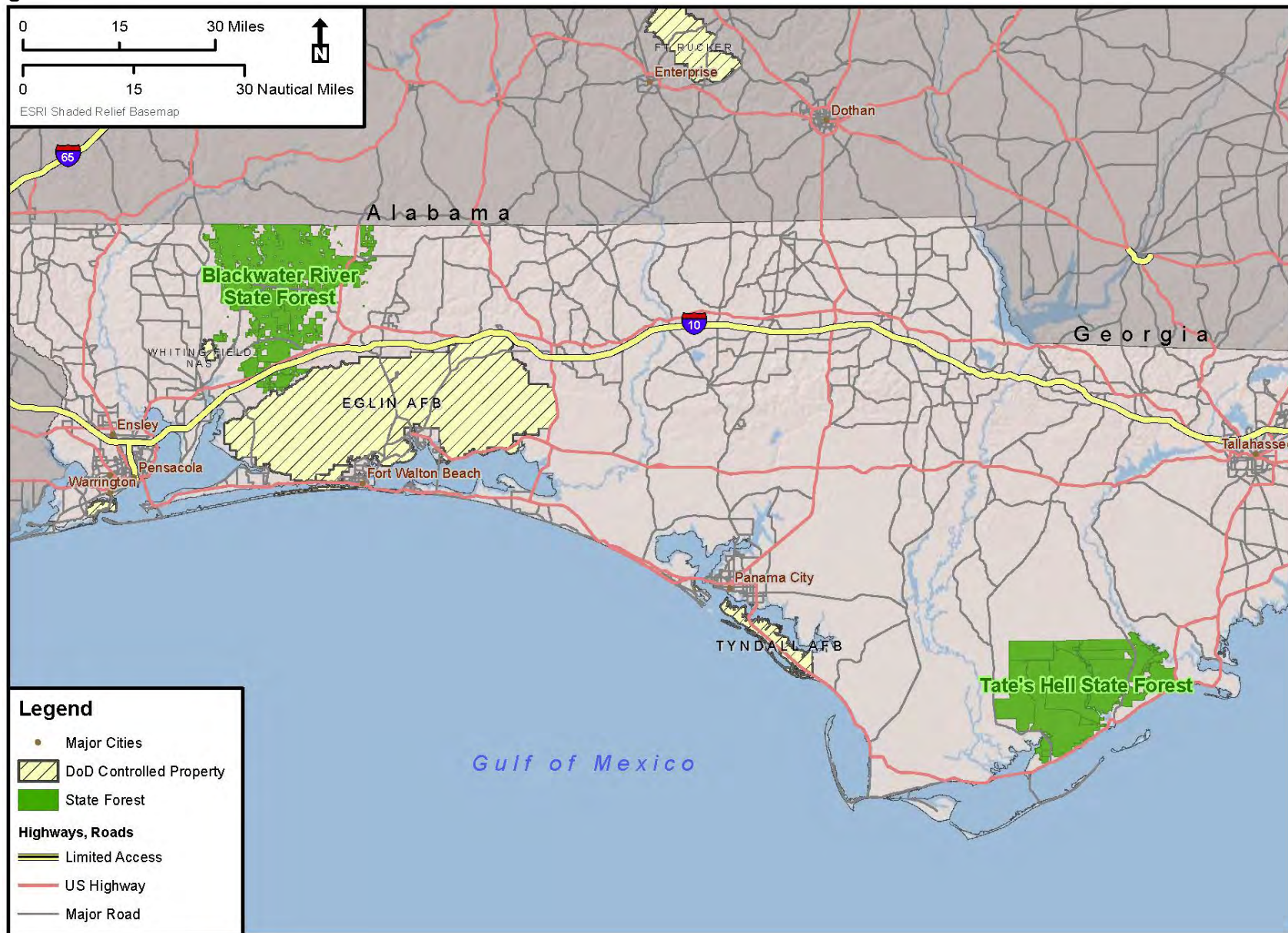
The proposed activities addressed within this document constitute a federal action and, therefore, must be assessed in accordance with the National Environmental Policy Act (NEPA). NEPA requires federal agencies to consider the environmental consequences of proposed actions in the decision-making process (42 United States Code [USC] 4321, et seq.). The Council on Environmental Quality (CEQ) was established under NEPA, 42 USC 4342, et seq., to implement and oversee federal policy in this process. In 1978, the CEQ issued regulations implementing the NEPA process under Title 40, Code of Federal Regulations (CFR), Parts 1500–1508. The Air Force EIAP for meeting CEQ requirements is accomplished via procedures set forth in CEQ regulations and 32 CFR Part 989. This EIS has been prepared in accordance with NEPA and 32 CFR Part 989.

Figure ES-1. GRASI Regional Airspace





**Figure ES-2. Location of Blackwater River and Tate's Hell State Forests**



## **ES.2. PURPOSE AND NEED**

### **ES.2.1 Purpose**

The purpose of the Proposed Action is to analyze the suitability of state lands already identified by state agencies, pursuant to memoranda of agreement under the GRASI Strategic Plan, as potentially available for siting training emitters and conducting a variety of nonhazardous military training activities to meet short-term needs. The intent of the GLI is not to establish new, dedicated-use military ranges but rather to develop additional training flexibility and diversity potentially available through established partnerships and agreements for use when training flexibility at existing military bases is not available. The intent of the GLI, therefore, is to provide military units with compatible locations that can serve as an outlet for training activities when they are otherwise unable to meet their requirements using current military training areas.

Specifically, this Proposed Action (the GLI, a component of the GRASI) is designed to develop additional regional training flexibility for nonhazardous military operations. This would be accomplished through two types of partnerships. The Air Force would partner with the State of Florida to obtain permits to use lands that the state has already identified as potentially available for training: BRSF and THSF (Figure ES-2). In addition, the Air Force would partner with the Florida Forest Service (FFS) and Florida Fish and Wildlife Conservation Commission (FWC) for use of associated lands for placement of temporary and mobile training radar emitters. Because complete implementation of these two partnerships may not add sufficient regional flexibility, the Air Force will continue to pursue and cultivate additional partnerships with other agencies. Such future actions, if and when agreed to and defined in sufficient detail for NEPA analysis, would be evaluated at the appropriate level under separate NEPA documentation.

### **ES.2.2 Need**

The Proposed Action is needed because there is a projected regional shortfall of military training and testing land and airspace in the GRASI region. The demand for the land range and use of restricted area over the Eglin Range Complex creates scheduling conflicts for nonhazardous training. The 96th Test Wing manages the Eglin Range to optimally schedule training and test activities. When testing activities for new aircraft and weapons systems occur, hundreds of thousands of acres of Eglin's range must be closed to training uses. Eglin AFB balances these training and testing mission requirements using a robust prioritization and scheduling process. This process allows Eglin AFB to meet the demands for those activities that the range has the capacity to support. When requested mission activities exceed the range's capabilities and capacity, additional training space is needed for compatible, nonhazardous mission activities. The Proposed Action is designed to provide an outlet for training only when the existing range space cannot accommodate training needs.

These measures would allow some mission activities a place to operate when the airspace is already being used by other mission activities. Emitter sites create realistic threat scenarios for pilots and more realistic training scenarios by simulating an



integrated air defense system (IADS), which helps with identifying and countering enemy missile or artillery threats from land or sea.

### **ES.3. DECISION TO BE MADE**

For purposes of this EIS, the decision to be made is whether to implement the Proposed Action (create flexibility by obtaining necessary permits/leases to use emitter sites in northwest Florida and conduct training activities as another permitted user of BRSF and THSF), Subalternative 1 (a reduced-scale version of the Proposed Action), or the No Action Alternative. The decision to be made also includes how to implement elements of the Proposed Action and the frequency of training activities. Implementation of the No Action Alternative would mean continuing all current training activities at the Eglin Range Complex using training workarounds to try to meet units' training needs to the maximum extent possible. The decision will be made by the Air Force Deputy Assistant Secretary for Installations (SAF/IEI).

It is important to note that Air Force decision-makers actually have a myriad of potential alternatives from which to choose. Each of the different training and emitter activities described in Chapter 2 can be completely eliminated from consideration or geographically or temporally restricted as part of eventual decisions to be made. The Air Force can therefore select from a broad spectrum of actions that are deemed compatible with current land uses.

The Air Force is employing this GLI EIS process to get public, partner, and agency feedback to assess training compatibility. Because this is a proposal for partnering with other agencies, the Air Force understands how crucial this feedback is to implementing a viable proposal. Ultimately, partner agencies, not the Air Force, will make final decisions to permit GLI activities.

### **ES.4. PROPOSED ACTION AND ALTERNATIVES**

The Proposed Action consists of two main components: establishment and use of emitter training sites on GRASI partner lands and applying to the FFS and FWC to be a permitted user of the northwest Florida state forests for nonhazardous training activities. Because Subalternative 1 consists of the same activities under the Proposed Action, only at a reduced scale, both the Proposed Action and Subalternative 1 are described within the same sections, with the differences between the two highlighted for easy comparison. This Proposed Action may not provide the most comprehensive solution for all training needs, as described in Sections 2.1 and 2.2. Should other partnerships identify additional training locations, they will be considered in conjunction with the appropriate level of additional NEPA analysis. At this time, no other suitable training locations have been identified in conjunction with GRASI partners as potentially available for use and no other elements of the GLI proposal have adequate project definition to warrant inclusion in this EIS.

At this time, no end-date is defined for whatever training use is ultimately approved by the FFS, the FWC, and State of Florida. Training activities would be projected to occur until such time as adequate range capacity became available on Eglin AFB to support the necessary training requirements. Ultimately, the FFS and FWC would specify the length of time that training activities would be permitted. The plans to support and

manage these activities will need to be reviewed annually and approved, if they are determined to still be compatible with existing land uses.

#### **ES.4.1 Proposed Action / Subalternative 1**

##### **ES.4.1.1 Emitter Sites**

A component of both the Proposed Action and Subalternative 1 is to establish up to 12 radar, telemetry, and emitter training sites throughout northwest Florida to support development of a simulated IADS to be used for air training. Radar and telemetry emitters are used for tracking aircraft and navigation; training emitters are radar simulator systems designed to help train military personnel to identify and counter enemy missile or artillery threats from land or sea. Types of emitters would vary depending on need, and their use would be determined by constraints associated with the site and respective operational parameters of the specific system. As an example, use of high-powered systems with large safety hazard distances may be restricted at sites in close proximity to populated areas.

Emitter training sites identified would utilize FFS and FWC lands via leasing agreements. These sites would accommodate mobile and temporary use; mobile use means that the site would be used for a day with operators on-site, while temporary use may last for several days. Proposed locations are shown in Figure ES-3. The majority of sites identified as part of the screening process are associated with FFS fire spotting towers, while two sites are owned by FWC and one site by Eglin AFB. All sites are either “improved” or “semi-improved.” Not all proposed sites may be used, and only several at any one time would be operational.

##### **ES.4.1.2 Training Activities in Northwest Florida State Forests**

Training activities associated with the Proposed Action and Subalternative 1 consist of utilizing existing areas cleared by the FFS as part of regular forest management activities for helicopter landing and drop zones, use of existing airfields for aircraft landings, and a number of different land and air training activities. These activities currently occur in the areas between designated test/training sites on the Eglin Range. The Air Force proposes to create flexibility by obtaining the necessary permits and leases to use public lands when current military training areas are not available for these activities. Specifically, suitable areas within two state forests in northwest Florida, BRSF and THSF, would be leased through agreements with FFS.

For the purposes of this EIS, each state forest has been divided into “tactical areas” (TAs), which correlate to each state forest recreational area as shown in Figures ES-4 and ES-5. Training activities may occur in any of the TAs, subject to restrictions identified via coordination with the FFS during the planning process, as well as any constraints or mitigations identified in this EIS. Training in the TAs would provide flexibility for those training units that are unable to schedule time on the Eglin Range or in the restricted area due to other higher-priority activities or range congestion.

All training activities in the state forests would be conducted per the requirements of Eglin AFB Instruction (EAFBI) 13-212, *Range Planning and Operations*, Chapter 7 – Environmental Management (December 2010, Interim Change on 9 September 2011), as applicable, and in accordance with the respective state forest management plans. EAFBI 13-212, Chapter 7, is available at <http://grasieis.leidoseemg.com/documentation.aspx>.

**Figure ES-3. Location Overview of Proposed Emitter Sites**

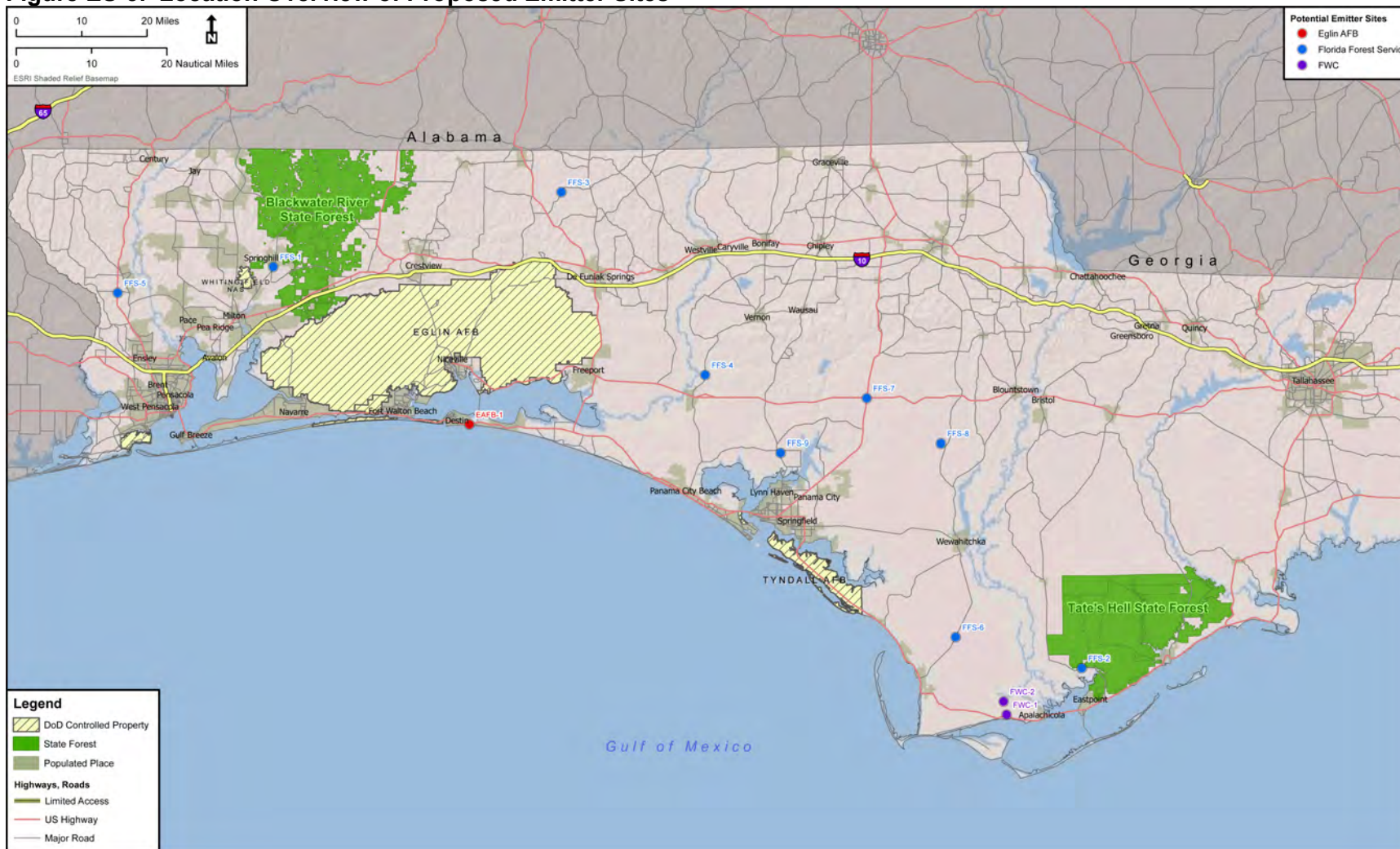




Figure ES-4. BRSF Tactical Areas

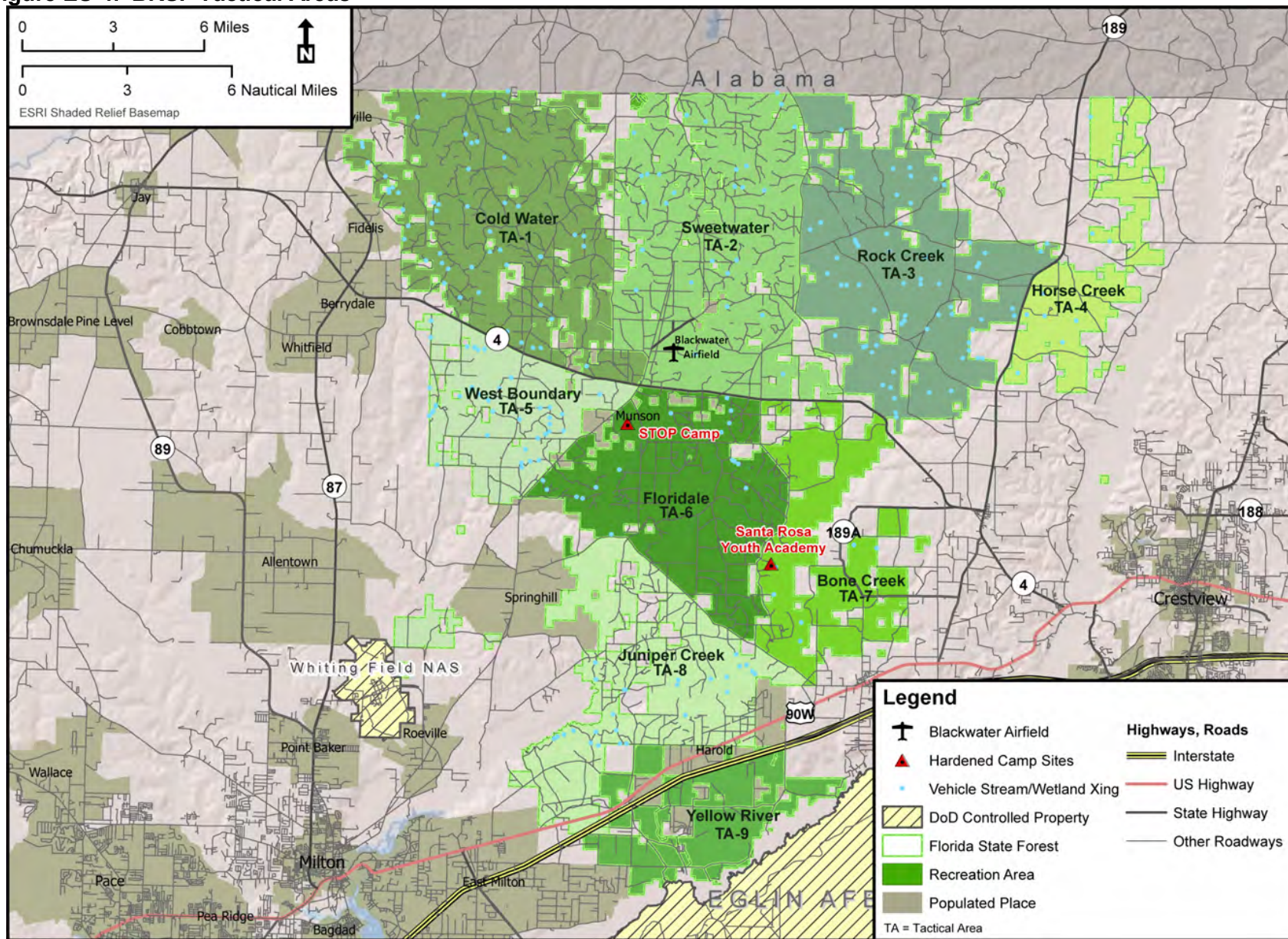
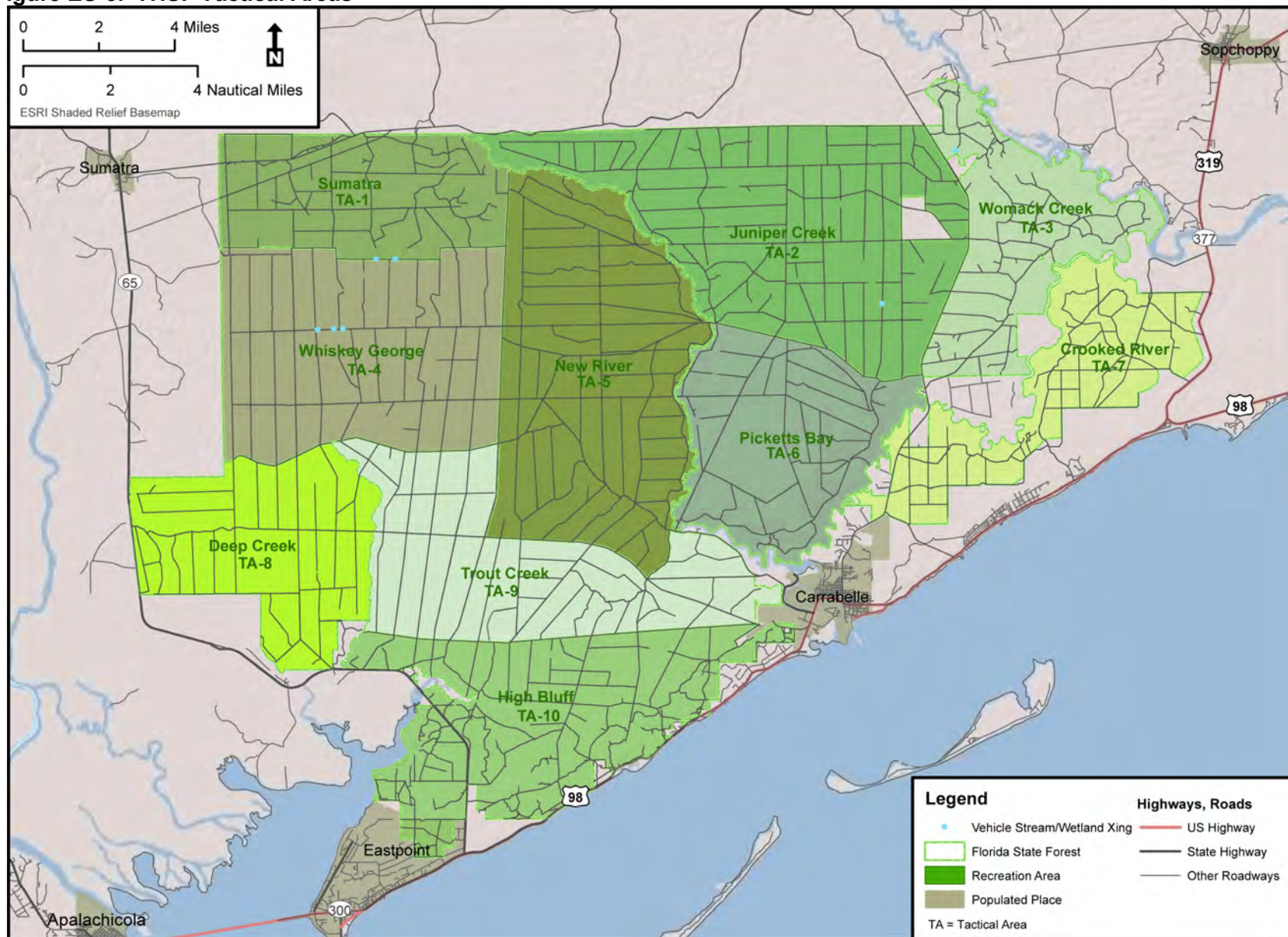




Figure ES-5. THSF Tactical Areas



The following subsections summarize proposed training activities; more detailed information can be found in Section 2.3.2 of the GLI EIS. These activities would be carried out by units of Air Force Special Operations Command located at Hurlburt Field, units of the 7th Special Forces Group (Airborne) located at Eglin AFB, F-35 Joint Strike Fighter and support units, and other Department of Defense units.

Training activities described under the Proposed Action are not mutually exclusive, and some training activities would occur in support of other activities or subsequent to other training activities. An example would be a training mission involving several helicopters flying from Eglin AFB to a BRSF tactical area Helicopter Landing Zone/Drop Zone (HLZ/DZ) where personnel and equipment would be dropped via an Airdrop or a low-level insertion/extraction. Personnel may then conduct Cross-Country Dismounted Movement (CCDM) training to hardened camp site location or another helicopter landing zone, while along the way bivouacking, Conducting Communications and Surveillance Operations (CCSO), and utilizing expendables. Once reaching their objective, they would be extracted either via another low-level insertion/extraction or Cross-Country Vehicle Movement (CCVM). Aircraft would use existing military operations areas and controlled airspace, as is currently done, to maneuver between Eglin AFB and the state forests.

The intent for implementing GLI training would be to start slowly and increase nonhazardous training utilization of THSF or BRSF to acceptable levels that are compatible with and can be supported by the FFS. Training would only be implemented to the extent that Department of Defense (DoD) units need the additional off-base training capacity to support nonhazardous activities. It is important to understand that new lands would not support full training utilization like dedicated military training ranges at Eglin AFB.

It is difficult to predict just how frequently units would utilize GLI locations to support their training requirements. Given this uncertainty, this EIS Proposed Action analysis evaluates impacts based on a “maximum-use scenario” that has been developed for each training activity. Evaluation of this scenario ensures that impact characterizations are conservative and do not underrepresent potential impacts should there be an occasion where maximum potential use would occur. Additionally, each maximum-use scenario is applied and analyzed for each forest in the event that one forest is unavailable for a certain type of training due to scheduling issues or other factors; this ensures that each forest is similarly treated in terms of potential impact. These maximum-use scenarios are detailed in tables accompanying each activity description and are based on existing Eglin AFB usage within the Eglin Range.

For Subalternative 1 a “reduced-scale scenario” is evaluated that identifies specific locations for training, as well as a number of activities and associated frequency and duration that are reduced from the “maximum-use” scenario addressed under the Proposed Action. As an example, under Subalternative 1 no expendable use would occur anywhere in either forest with the exception of the hardened camp sites at BRSF. These Subalternative 1 details are highlighted in conjunction with descriptions of the Proposed Action. Under either scenario, numbers of personnel used during training activities typically range from 10 to 50 and may involve any number and type of vehicles. Personnel would travel to BRSF either by road or aircraft as part of training.



The goal of the analysis in the EIS is to identify potential impact areas and identify constraints associated with their use as related to the training activities described in Chapter 2. The analyses identify (1) potential impacts associated with training activities, (2) areas that should be avoided for certain activities, and (3) any mitigations or management requirements needed to minimize adverse impacts. The user constraints and mitigations would be used for planning and scheduling purposes by the Air Force in coordination with the FFS.

#### ES.4.1.2.1 Helicopter Landing Zones/Drop Zones



**Typical HLZ/DZ**

Under both the Proposed Action and Subalternative 1, existing cleared areas within the state forests would be utilized as landing sites for helicopters and DZs for personnel and equipment from various aircraft (either fixed- or rotary wing). Under the Proposed Action several sites located throughout the state forests may be established and utilized at any one time. These sites would be open areas that have already been cleared of tall vegetation by the FFS through regular forest

management activities. Under Subalternative 1, 16 initial LZ/DZ locations (including Blackwater Airfield) have been identified for potential use: 13 at BRSF and 3 at THSF. Under the Proposed Action and Subalternative 1, up to eight LZs/DZs (including the hardened camp site locations and Blackwater Airfield) may be active at one time, distributed between the forests. Table ES-1 details HLZ/DZ activities.

**Table ES-1. LZ/DZ Details**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
None <sup>1</sup>	Varies depending on size and location of LZ/DZ as well as associated training activity (see subsequent sections).				Only utilize locations previously cleared by the FFS as part of regular forest activities. No land disturbance in wetlands or floodplains; no new impervious surfaces.
Subalternative 1 Locations					
LZ/DZ Identifier	Location / Description				Approximate Size (rounded to nearest acre)
Blackwater Airfield	A FFS-managed airfield to which the FFS permits public access on a “request” basis, should its condition be judged safe and not otherwise in use. The Air Force would also request to use the airfield in a similar manner.				25
BW2	Reclaimed Oil Well Site				1
BW3	Reclaimed Oil Well Site				1
BW6	Wildlife Opening				7
BW7	Wildlife Opening				6
BW8	Wildlife Opening				6

**Table ES-1. LZ/DZ Details, Cont'd**

Subalternative 1 Locations (Cont'd)		
LZ/DZ Identifier	Location / Description	Approximate Size (rounded to nearest acre)
BW9	Wildlife Opening	7
BW10	Wildlife Opening	7
BW11	Wildlife Opening	3
BW12	Wildlife Opening	57
BW13	STOP Camp	3
BW14	Clay Pit	11
BW17	SRYA Ball Field	2
TH2	Existing FFS helo-pad	2
TH4	Existing FFS helo-pad	1
TH6	Existing FFS helo-pad	0.5

1. LZ = landing zone; DZ = drop zone; FFS = Florida Forest Service; SRYA = Santa Rosa Youth Academy; STOP = Short-Term Offender Program
2. 1. Establishment, operations, and maintenance as part of regular FFS activities; the Air Force would not conduct land-disturbing activities.

#### ES.4.1.2.2 Use of Expendables

Use of Expendables (UoEX) involves use of various training munitions and pyrotechnics, including simulated munitions (consisting of plastic pellets or paintballs, which produce little or no noise) and smoke grenades during training activities. For the Proposed Action, at BRSF, noise-generating expendables (e.g., blanks) would only be used at hardened camp site locations and at THSF, noise-generating expendables could be used anywhere (pending results of analysis and subject to use restrictions as identified in this EIS). Under Subalternative 1 no expendables would be used outside hardened camp sites at BRSF; and there would be no expendable use at THSF. Table ES-2 details UoEX activities.



**Smoke Grenade**

**Table ES-2. UoEX Details**

Proposed Action			
Expendable Type	Estimated Maximum Quantity Per Year	Estimated Average Per Event	Restrictions
5.56-millimeter blank	~576,000	~10,000	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Police brass/expendable waste, avoid public use areas when using blanks.
7.62-millimeter blank	~196,200	~8,000	
Ground burst simulators	~5,172	~2 to 5	
M-18 smoke grenades	~4,038	~2 to 5	
Paintballs/plastic pellets	~50,000	~5,000	
Flares	Emergency use only – not associated with training activities		At BRSF noise-generating expendable use only at hardened camp sites.
5.56-millimeter blank	~600,000	~10,000	Activity consists of 60 total days per year, with frequency up to eight 5-day periods.
7.62-millimeter blank			

**Table ES-2. UoEX Details, Cont'd**

Proposed Action			
Expendable Type	Estimated Maximum Quantity Per Year	Estimated Average Per Event	Restrictions
Ground burst simulators	~5,172	~2 to 5	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Police brass/expendable waste.  Expendable use only at BRSF hardened camp sites. None at THSF.
M-18 smoke grenades	~4,038	~2 to 5	
Paintballs/plastic pellets	~50,000	~5,000	
Flares	Emergency use only – not associated with training activities		

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; THSF = Tate's Hell State Forest

### ES.4.1.2.3 Low-Level Helicopter Insertions/Extractions

Low-Level Helicopter Insertions/Extractions (LLHI/E) involve flying helicopters near treetop level and above to an HLZ/DZ and inserting or extracting personnel. Insertion/extraction of personnel is conducted via fast rope, rappel, ladder, hoist or other means. Aircraft would fly between just above the surface to 3,000 feet above ground level (AGL). Table ES-3 details LLHI/E activities. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency of LLHI/E events, as shown in Table ES-3.*

**LLHI/E Activity****Table ES-3. LLHI/E Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to 4 total aircraft, combination of UH-60, CH-47, MH-47  There would be no more than 2 CV-22s used per event.	Up to 50 inserted/extracted	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	4–6 hours  Day and night	2 times/month (spread out among LZs/DZs)	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoidance of established recreational sites.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	3–5 days at a time (spread out among 5 LZs/DZs)  2 times/year	Same

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; LZ = landing zone; mm = millimeter; THSF = Tate's Hell State Forest



#### ES.4.1.2.4 Temporary Combat Support Areas



**TCSA Activity**

Under both the Proposed Action and Subalternative 1, Temporary Combat Support Areas (TCSAs) involve set-up of logistical and medical tents and equipment around LZs/DZs and Blackwater Airfield in support of training activities. Table ES-4 details TCSA activities. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency of TCSA events, as shown in Table ES-4.*

**Table ES-4. TCSA Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
May arrive at location via various aircraft or land vehicles	Up to 50	Paintballs/plastic pellets, M-18 smoke grenades, tents, generators  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day and night	Tied to frequency of other LZ/DZ activities.	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoidance of established recreational sites.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	2 times/year	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; GBS = ground burst simulator; FFS = Florida Forest Service; mm = millimeter; THSF = Tate's Hell State Forest

#### ES.4.1.2.5 Airdrops

Airdrops (ADs) involve the insertion and/or resupply of personnel via release of troops or equipment over land-based DZs or over water. This activity would be in support of training activities. Table ES-5 details AD activities. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency/ location of airdrop events as shown in Table ES-5.*



**Static Line Personnel Drop**

**Table ES-5. Airdrop Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, C-130, C-17, C-145; CV-22  There would be no more than 2 CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Land drops: approximately 15 cubic foot container of water (~300 pounds); containerized delivery system (~500 pounds); paintballs/plastic pellets, M-18 smoke grenades  Water drops: 2 Zodiacs	24 hours  Day and night	4 times/day 232 days/year (spread out among LZs/DZs)  C-17 used 2-3 times/year	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoid established recreational sites and public boaters. No power motors in Bear Lake (BRSF). Avoidance of noise impacts to private landowners and established recreational sites during approach and departure.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	Static Line Personnel Drops and HALO: Quarterly  Equipment/CDS drops: BW6 & BW7 only 10 days/month up to 40 days/year	Same  Static Line Personnel Drops restricted to LZ/DZ BW12

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; LZ = landing zone

#### **ES.4.1.2.6 Air/Land Vertical Lift**

Air/Land Vertical Lift (A/LVL) involves the insertion and/or resupply of personnel and/or equipment via landing an aircraft directly into an HLZ or on a fixed-wing aircraft landing site. Table ES-6 details A/LVL activities. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables as shown in Table ES-6.*



**A/LVL Activity**

**Table ES-6. A/LVL Details per Event**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to two total aircraft, combination of CV-22, UH-60, CH-47, C-130, C-145.	Up to 72 depending on associated training activity and aircraft.	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	4x/day 232 days/year (spread out among LZs/DZs at each forest)  Blackwater Airfield used up to 12 times/year	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoidance of noise impacts to private landowners and established recreational sites during approach and departure.
Subalternative 1					
Same	Same	<b>None (except at BRSF hardened camp site LZ/DZs)</b>	Same	Same	Same

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; LZ = landing zone; mm = millimeter; THSF = Tate's Hell State Forest

#### ES.4.1.2.7 Cross-Country Dismounted Movements

CCDMs involve the movement of operators (i.e., personnel) on foot across land areas from one location to another as part of simulated assault and reconnaissance training activities. CCDM may occur on or off roads or on unimproved trails. CCDM may also include crossing of streams and wetland areas. Table ES-7 details CCDM activities. *The difference between the Proposed Action and Subalternative 1 is that under the Proposed Action CCDM may occur anywhere within the forest per the restrictions identified in the EIS, while under Subalternative 1 dismounted movements would only occur in a proposed movement corridor identified between Blackwater Airfield and a BRSF hardened camp site (STOP Camp), and there is a reduced use of expendables.* The movement corridor is approximately 476 acres in size



**CCDM Activity**

**Table ES-7. CCDM Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
None	Up to 72 depending on associated training activity  Personnel would be in groups of 12	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	2 times/quarter	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoid established recreational sites.
Subalternative 1					
None	Same	<b>None (except at BRSF hardened camp sites).</b>	Same	Same	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest



### ES.4.1.2.8 Roadway Vehicle Use



#### CCVM Activity

Roadway Vehicle Use (RVU) involves the movement of personnel transport vehicles (ranging from high-mobility multipurpose wheeled vehicles [HMMWVs] to 2.5-ton trucks) and all-terrain vehicles (ATVs) across established roads from one location to another in support of resupply, logistics, and troop transport. RVU will utilize established roadways and associated easements, as well as vehicle water crossing points currently established and utilized by the FFS. Table ES-8 details CCVM activities. *The difference between the Proposed*

*Action and Subalternative 1 is that under Subalternative 1 there would be a reduced use of expendables.*

**Table ES-8. CCVM Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs	Up to 5/vehicle  Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	3 times/quarter	Vehicles are restricted to designated forest roads only. Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10).
Subalternative 1					
Same	Same	None (except at BRSF hardened camp sites)	Same	Same	Same

ATV = all-terrain vehicle; BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; RVU = Roadway Vehicle Use; THSF = Tate's Hell State Forest

### ES.4.1.2.9 Blackout Driving

Blackout Driving (BD) involves nighttime driving of ATV-type vehicles and HMMWVs without full headlights. Headlights would be diminished to "cat eyes," which are essentially small slits placed over the headlights; this provides enough light to utilize night vision goggles while driving. Roads used for this activity would be temporarily closed (likely in concert with emplacement of obstacles) to the public to prevent safety mishaps. Table ES-9 details BD activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

**Table ES-9. Blackout Driving Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Motorcycles, lightweight tactical ATVs (quad runners), HMMWVs	Up to 5/vehicle  Up to 10 vehicles	None	8 hours	3 times/quarter	Only on closed/designated roads.
Subalternative 1					
Would not occur					

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle

#### ES.4.1.2.10 Emplacement of Obstacles

Emplacement of Obstacles (EoO) involves placement of items such as plastic or nylon fencing along unpaved roads and Hardened Camp Sites; no concertina wire or barbed wire would be used. The ground surface may be slightly disturbed (within 6 inches of ground surface) from placement of stakes and pickets. All wire, stakes, and/or pickets would be recovered at completion of the training exercise. Table ES-10 details EoO activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*



EoO Activity

Table ES-10. EoO Details per Event

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	N/A	Plastic/nylon fencing  Stakes/pickets	Length of associated training exercise  Day or night	10 times/year	Removal of all obstacles after exercise. Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10).
Subalternative 1					
Would not occur.					

EIS = Environmental Impact Statement; FFS = Florida Forest Service

#### ES.4.1.2.11 Bivouacking/Assembly Areas



B/AA Activity

Bivouacking/Assembly Areas (B/AA) involve the use of an area, mainly tented, where troops eat and rest overnight in support of training activities. There may be slight surface ground disturbance (within 6 inches of ground surface) from placement of tent stakes and pickets. All expendables/equipment would be recovered prior to leaving the site. Table ES-11 details B/AA activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

Table ES-11. B/AA Details per Event

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Three ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Tents and other supplies.  Stakes/pickets	Length of associated training exercise. Day or night	10 times/year	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10).
Subalternative 1					
Would not occur.					

ATV = all-terrain vehicle; EIS = Environmental Impact Statement; FFS = Florida Forest Service

#### ES.4.1.2.12 Communications and Surveillance Operations

Communications and Surveillance Operations (C&SO) involve the use of sites to coordinate communications and/or conduct surveillance of “enemy forces” in support of training activities. The ground surface may be slightly disturbed from placement of tent stakes and pickets. Table ES-12 details C&SO activities. This activity would occur under both the Proposed Action and Subalternative 1. *There is no difference between the Proposed Action and Subalternative 1 for this activity.*

**Table ES-12. C&SO Details per Event**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, rental vehicles (trucks), ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Communication equipment, radio antennas, tents, radar equipment, camouflage nets, generators. The Air Force would use standard equipment; however, the goal when employing generators is to minimize noise and detection footprints. As such, the Air Force would use generators in the forests temporarily, only when necessary, and as approved by the FFS.	Length of associated training exercise  Day or night	Monthly	Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoidance of established recreational sites.

ATV = all-terrain vehicle; EIS = Environmental Impact Statement; FFS = Florida Forest Service; HMMWV = high-mobility multipurpose wheeled vehicle

#### ES.4.1.2.13 Amphibious Operations

Amphibious operations involve boat operations on the water, loading/unloading of personnel to and from boats, and movement in streams, rivers, and lakes as part of egress/ingress operations. Amphibious activities would avoid those waterways used extensively for recreational purposes (e.g., Coldwater Creek) and would mostly utilize larger bodies of water given the size requirements for the amphibious watercraft. Should recreational users and military trainees be present on the same body of water, training activities would not impede canoers, kayakers, or tubers. Table ES-13 details amphibious operations activities. This activity would not occur under Subalternative 1. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*



**Amphibious Operations**

**Table ES-13. Amphibious Operations Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to six various inflatable and rigid powered watercraft per event; engines 35 to 200 hp. Watercraft may consist of Zodiacs and aluminum boats up to 28 feet with or without outboard motors.	Up to 6/watercraft	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	12 hours  Day and night	10 times/year	Avoid established recreational sites and public boaters. No power motors in Bear Lake (BRSF).
Subalternative 1					
Would not occur.					

BRSF = Blackwater River State Forest; hp = horsepower; mm = millimeter; THSF = Tate's Hell State Forest



#### ES.4.1.2.14 Natural Resource Consumption

Natural Resource Consumption (NRC), similar to survival training, is the procurement of natural food sources such as small game and rodents, and eating of vegetation. Survival training is a critical component of military training and involves foraging and training personnel on critical survival skills (which includes teaching how to prepare traps and snares). It does not involve substantial consumption of natural resources and the likelihood of successful snaring or trapping is traditionally minimal. Locations of avoidance areas (e.g., sensitive habitat areas and species) would be communicated to participants prior to implementation of the activity. Table ES-14 details NRC activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

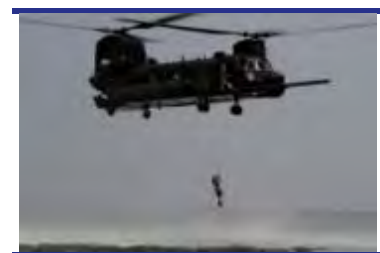
**Table ES-14. NRC Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	20 (10 teams at 2/team)	None	7 days Day and night	2 times/quarter	Avoid protected wildlife and plants.
Subalternative 1					
Would not occur.					

N/A = not applicable

#### ES.4.1.2.15 Overwater Hoist Operations

Overwater Hoist Operations (OHO) involve hoist rescue and recovery of personnel and watercraft over water. Aircraft would conduct operations from just above the surface of the water to a height of about 150 feet. Aircraft would hover about 10 feet over the surface for drops and about 80 feet above the surface for retrievals. Table ES-15 details OHO activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 there would be no expendable use.*



**OHO Activity**

**Table ES-15. OHO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Watercraft (see Table 2-15)  Four total aircraft, combination of CV-22, HH-60, CH-47  There would be no more than 2 CV-22s used per event.	Up to 6/watercraft, including one safety swimmer, coxswain, medic, and assistant coxswain	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	4 to 6 hours  Day and night	1/month	No power motors in Bear Lake (BRSF). Avoid fishermen and boaters.
Subalternative 1					
Same	Same	None	Same	Same	Same

BRSF = Blackwater River State Forest; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

#### ES.4.1.2.16 Opposing Forces Vehicle Operations

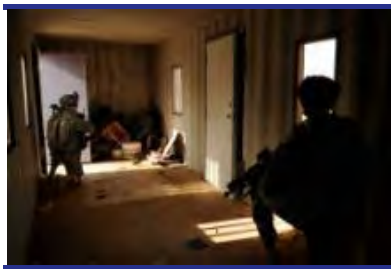
During Opposing Forces Vehicle Operations (OFVO), two teams (one “Red,” the other “Blue”) compete to locate each other on established roads in a simulated urban environment. Personnel may exit vehicles to conduct “search activities.” Aircraft may be used as a “spotter” to direct one of the teams; the aircraft would fly at between 16,000 and 23,000 feet AGL. Table ES-16 details OFVO activities. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 there would be no expendable use except at BRSF hardened camp sites.*

**Table ES-16. OFVO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWV  Cessna 172 aircraft	Up to 5/vehicle  Up to 10 vehicles	M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	Day and night	5 times/week	Vehicles are restricted to forest roads, designated roads only. Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoid established recreational sites.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp sites)	Same	Same	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate’s Hell State Forest

#### ES.4.1.2.17 Hardened Camp Site Use



**Urban Combat Training**

Hardened Camp Site Use (HCSU) involves use of two hardened camp facilities located at BRSF. Both camps were established by the Florida State Department of Juvenile Justice (DJJ); one is identified as the Short-Term Offender Program (STOP) Camp, the other is the Santa Rosa Youth Academy. The STOP Camp was leased by the DJJ from FFS and returned after the program was shut down. These sites consist of buildings and infrastructure, such as utilities and roadways, and may be used as insertion/extraction points, HLZs/DZs, command and control centers, training areas for combat in urban environment training, or other training activity support. Table ES-17 details HCSU activities. *The difference between the Proposed Action and Subalternative 1 is that under Subalternative 1 UoEX activity consists of 60 total days per year, with frequency up to eight 5-day periods.*

**Table ES-17. HCSU Details per Event (BRSF)**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Aircraft: CV-22, HH-60, CH-47  There would be no more than 2 CV-22s used per event.  Vehicles: ATV-types HMMWVs	Up to 50	5.56-mm blanks, 7.62-mm blanks, GBSs, paintballs/plastic pellets, M-18 smoke grenades; simunitions	24 hours  Day and night	5 times/week 232 days/year	Upkeep and maintenance of facility.
Subalternative 1					
Same	Same	Same types of expendables. <b>Use: 60 total days per year, with frequency up to eight 5-day periods.</b>	Same	Same	Same

ATV = all-terrain vehicle; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter

## ES.4.2 Summary Comparison of Proposed Action and Subalternative 1 (Preferred Alternative) Details

The main differences between the Proposed Action and Subalternative 1, as described in Section ES.4.1, are summarized in Table ES-18.

**Table ES-18. Proposed Action and Subalternative 1 Detail Summary**

Action Component	Proposed Action	Subalternative 1
Emitter Sites	12 proposed sites	11 proposed sites
LZs/DZs	May potentially occur anywhere within BRSF/THSF subject to identified constraints in Section ES.4.3 and EIS Section 2.5.	13 potential LZs/DZs identified at BRSF (including Blackwater Airfield).  3 potential LZs/DZs identified at THSF.
Use of Expendables	At BRSF use of noise generating expendables limited to hardened camp sites; other expendables approved anywhere subject to identified constraints in Section ES.4.3 and EIS Section 2.5.  At THSF all expendables approved subject to constraints in Section ES.4.3 and EIS Section 2.5.	At BRSF use of all expendables only approved at hardened camp sites; limited to 60 total days per year.  At THSF no expendables approved for use.
Low-Level Helicopter Insertions/Extractions	Overall, frequency is twice/month. At BRSF, expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.	Overall, frequency is twice/year.  At BRSF expendable use only approved at hardened camp sites.  At THSF, no expendable use.



**Table ES-18. Proposed Action and Subalternative 1 Detail Summary, Cont'd**

Action Component	Proposed Action	Subalternative 1
Temporary Combat Support Areas	<p>Overall frequency ties to other activities.</p> <p>At BRSF, expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise generating expendables only at hardened camp sites.</p> <p>At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.</p>	<p>Overall, frequency is twice/year.</p> <p>At BRSF expendable use only approved at hardened camp sites.</p> <p>At THSF, no expendable use.</p>
Airdrops	<p>Overall frequency is 4 times/day, 232 days/year (spread out among LZs/DZs).</p> <p>Expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5.</p>	<p>Static Line Personnel Drops and HALO: Quarterly</p> <p>Equipment/CDS drops: BW6 &amp; BW7 only 10 days/month up to 40 days/year</p> <p>Static Line Personnel Drops restricted to LZ/DZ BW12</p> <p>No expendable use anywhere except BRSF hardened camp sites.</p>
Air/Land Verical Lift	<p>At BRSF expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise generating expendables only at hardened camp sites.</p> <p>At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.</p>	<p>No expendable use anywhere except BRSF hardened camp sites.</p>
Cross-Country Dismounted Movements	<p>Movement may occur anywhere on either forest per constraints identified in Section ES.4.3 and EIS Section 2.5.</p> <p>At BRSF expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise-generating expendables only at hardened camp sites.</p> <p>At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.</p>	<p>At BRSF movement may only occur within the movement corridor identified in EIS Section 2.3.2.8.</p> <p>At BRSF expendable use limited to hardened camp sites.</p> <p>At THSF no expendable use.</p>
Roadway Vehicle Use	<p>At BRSF expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise-generating expendables only at hardened camp sites.</p> <p>At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.</p>	<p>No expendable use anywhere except BRSF hardened camp sites.</p>
Blackout Driving	Would occur per Table ES-9.	Would not occur.
Emplacement of Obstacles	Would occur per Table ES-10.	Would not occur.

**Table ES-18. Proposed Action and Subalternative 1 Detail Summary, Cont'd**

Action Component	Proposed Action	Subalternative 1
Bivouacking/ Assembly Areas	Would occur per Table ES-11.	Would not occur.
Communications and Surveillance Operations	No difference – would occur per Table ES-12.	
Amphibious Operations	Would occur per Table ES-13.	Would not occur.
Natural Resource Consumption	Would occur per Table ES-14.	Would not occur.
Overwater Hoist Operations	At BRSF expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5.  At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.	No expendable use at either forest.
Opposing Forces Vehicle Operations	At BRSF expendable use permitted anywhere per constraints identified in Section ES.4.3 and EIS Section 2.5; noise-generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section ES.4.3 and EIS Section 2.5.	At BRSF expendable use limited to hardened camp sites.  At THSF no expendable use.
Hardened Camp Site Use	Potential expendable use frequency: 5 times/week, 232 days/year.	Reduced expendable use frequency: 60 total days per year, with frequency up to eight 5-day periods.

BRSF = Blackwater River State Forest; DZ = drop zone; LZ = landing zone; THSF = Tate's Hell State Forest

### ES.4.3 Operational Constraints

Section 2.5 of the EIS outlines more than 100 operational constraints associated with the Proposed Action. The operational constraints are components of the Proposed Action and would be implemented as part of the GLI proposal. The constraints serve to minimize or alleviate adverse impacts to the human and natural environment. The constraints would be incorporated into the EAFBI 13-212 operational plan as a special section on the state forests and would be reviewed and updated as required on an annual basis to ensure ongoing compatibility.

In order to ensure that all General Operational Constraints are identified and adhered to by training units, Eglin AFB's environmental management program has developed "Protection Levels" for areas on the Eglin Range that are utilized for ground training activities. These levels are based on General Operational Constraints and are integral to environmental resource protection. Under the Proposed Action, the Air Force would utilize a similar system tailored for BRSF and THSF; protection levels for the Proposed Action for both ground operations and noise are described in Tables ES-19 and ES-20, respectively, and are applicable to all training locations within the boundaries of the state forests. Activity outside the boundaries of the state forests is limited to use of public roadways for transportation.

**Table ES-19. General Protection Levels for Proposed Action Ground Operations**

Protection Level	Restrictions	Area Covered
Prohibited	No access is permitted.	Camp/recreational sites, any cultural resource “prohibited areas,” piping plover critical habitat (THSF)
Restricted	All activities must remain on roadbeds of established roads, including troop movements, vehicle operations, digging, and any type of ground surface disturbance. No refueling of vehicles or aircraft allowed.	Point locations for apiaries; sensitive species locations and associated FNAI sensitive habitats (pitcher plant bogs, rare plants, rare animals, invasive species); 200-foot buffer around Florida Natural Scenic Trail and equestrian trails; 1,500 feet around flatwoods salamander habitat; 330-foot buffer around bald eagle nests.
RCW Buffer	Follow <i>Management Guidelines for the Red-Cockaded Woodpecker on Army Installations</i> (U.S. Army, 2007) and <i>Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion</i> (U.S. Air Force, 2013), Table 4-2.	200-foot buffer around RCW cavity trees for ground operations
Wood Stork Habitat Buffer	Follow <i>Habitat Management Guidelines for the Wood Stork in the Southeast Region</i> (USFWS, 1990).	500-foot buffer around wood stork feeding/roosting habitat. Currently there are no GIS data for habitat at either forest. However, should habitat be identified, these protections would be applied.
Limited Use-1 (LU-1)	<u>Approved Activities</u> : use of star cluster pyrotechnics (hand-held slap flares) only for emergency purposes; use of non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for paintballs only) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver and incidental and consumptive land disturbance. <u>Not Approved</u> : use of smokes, flares, or simulators; off-road vehicle use – all vehicles must remain on established roads; land development and point land disturbance outside of previously disturbed roadbeds and road shoulders. LZ/DZ use except on approved FFS sites not requiring additional land development – see Noise Protection Levels Map for further restrictions on LZ/DZ use. No refueling of vehicles or aircraft allowed.	100 feet around wetlands, water bodies and floodplains; areas exhibiting very limiting soil characteristics (e.g., susceptible to erosion) for LZ and/or bivouacking; cultural resource areas with inadequate surveys and/or “not cleared” areas; Tate’s Hell Camp Gordon Johnson Historic District
Limited Use-2 (LU-2)	<u>Approved Activities</u> : use of pyrotechnics (e.g., smoke grenades and GBSs) and non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for smoke grenades and paintballs only, with GBSs permitted only at hardened camp sites) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver. Incidental, point, and consumptive land disturbance (includes catholes) outside of previously disturbed roadbeds and road shoulders if approved by FFS. LZ/DZ use only on approved FFS sites with FFS coordination required for any additional land disturbance – see Noise Protection Levels Map for further restrictions on LZ/DZ use. Refueling of vehicles or aircraft allowed only on asphalt or concrete surfaces. <u>Not Approved</u> : off-road vehicle use – all vehicles must remain on established roads.	All areas not covered by other protection levels

BRSF = Blackwater River State Forest; DZ = drop zone; FFS = Florida Forest Service; FNAI = Florida Natural Areas Inventory; GBS = ground burst simulator; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; LU-1 = Limited Use-1; LU-2 = Limited Use-2; LZ = landing zone; RCW = red-cockaded woodpecker; THSF = Tate’s Hell State Forest; USFWS = U.S. Fish and Wildlife Service

**Table ES-20. Noise Protection Levels for Proposed Action Operations**

Protection Level	Restrictions	Area Covered
Not Approved for LZs/DZs	No LZs or DZs permitted.	2,200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
Avian Air Operations Buffer	No aircraft operations permitted.	500-foot buffer around RCW trees; 1,000-foot buffer around bald eagle nest trees.
Not Approved for Overflights below 500 feet AGL	No overflights below 500 feet AGL.	TA-5 horse riding/field trial area; 200-foot buffer around camp sites/recreational sites, the Florida National Scenic Trail, and in/out parcels with residential structures.
Not Approved for Noise Generating Expendables	No noise generating expendable use allowed; includes blanks and GBSs.	4,000-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.

AGL = above ground level; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone; RCW = red-cockaded woodpecker

As stated previously, General Operational Constraints are inherent to the Proposed Action, in that they are considered components of the Proposed Action's implementation. As an example, a 200-foot activity buffer around identified red-cockaded woodpecker (RCW) cavity trees is a requirement of EAFBI 13-212. Just as CCDM at BRSF and THSF is a component of the Proposed Action, so too is the requirement to maintain a 200-foot activity buffer around RCW trees at either BRSF or THSF, since EAFBI 13-212 would be a component of the Proposed Action. Impact analysis in this EIS considers these requirements as part of the initial impact assessment. Thus, analysis of impacts to the RCW considers the implementation of the 200-foot activity buffer in the initial impact assessment; if potentially adverse impacts are identified, then Proposed Resource-Specific Mitigations were developed to minimize or avoid this potential.

#### **ES.4.4 No Action Alternative**

Under the No Action Alternative, the training activities identified under the Proposed Action would continue to occur on Eglin AFB as described and assessed in the *Interstitial Area Range Final Environmental Assessment Revision 2* and *Eglin AFB Riverine/Estuarine Environmental Assessment*. BRSF and THSF would not be utilized, and no new emitter sites would be used.

The No Action Alternative would not meet the purpose and need for the Proposed Action, in that there would be continued stress on the Eglin AFB user environment due to conflicts with hazardous and nonhazardous training activities. As use of the Eglin Range increases, these conflicts would become more frequent and problematic. Activities at BRSF, THSF, and the various proposed emitter sites would continue as described in the respective state forest management plans.



## ES.5. ALTERNATIVE IMPACT ANALYSIS SUMMARY

The following provides an impact summary of the analyses presented in the Final EIS Chapters 3, 4, 5, and 6. Details on each specific action and the potential impacts as related to the respective location can be found in these chapters. The significance of impacts was determined by evaluating the context, intensity, and duration of the action (40 CFR 1508.27) and the relative effect on individual resources; context, intensity, and duration factors used in the analyses are described in each respective Chapter 3 resource area discussion. The impact analyses considers direct, indirect and cumulative impacts on resource along with how both beneficial and adverse impacts affect public safety, the characteristics of the geographic area and proximity of the Proposed Action and Subalternative 1 to sensitive resources, the potential controversial nature of the potential impact, whether possible effects are highly uncertain or involve unique or unknown risks, whether the action may establish a precedent for future actions with significant effects, cumulative impacts, impacts to cultural resources or endangered species, and whether the Proposed Action threatens to violate federal, state, or local laws or environmental protection requirements. Each of these aspects is addressed as appropriate in the applicable resource area sections and chapters in this EIS. General criteria for impacts to resource/issue areas are summarized below and are presented relative to individual resource/issue areas at each proposed location in Table ES-21:

- **Beneficial** – Beneficial impacts may occur under any context, intensity, or duration. These generally result in some benefit or overall improvement to the resource impacted by the action. Such impacts may include a reduction in air emissions or restoration of habitats; the scope of the impact is directly related to the context, intensity, and duration of the impact. Elimination of baseline air emissions or restoration of large areas of disturbed wetland may be considered significant beneficial impacts, while a small reduction in baseline air emissions or restoration of a small pocket of wetlands may be considered beneficial but relatively insignificant. Other than providing benefits to Air Force training capabilities, the Air Force has not identified any significant or insignificant beneficial impacts under the Proposed Action or Subalternative 1.
- **Adverse** – Adverse impacts generally result in detriment or degradation of the impacted resource, the degree or level of impact directly related to the context, intensity, and duration of the impact. The Air Force has identified the potential for adverse impacts for several resource areas; resources experiencing potential adverse impacts are shaded yellow in Table ES-21. Adverse impacts can either be significant or insignificant.
  - **Significant** – Physical aspects are easily perceptible, and typically endure over the medium-to-long term, with a regional context and a high intensity; however, significant impacts can occur potentially over the short term under any context given a high intensity. Significant adverse impacts are typically not recoverable over the short term, and require long-term recovery processes with extensive mitigation or revision of Proposed Action or Subalternative 1 to avoid or minimize impacts. An example of a

significant adverse impact would be destruction of large percentages of wetland areas or degradation of water quality that may affect human health and the environment.

- **Insignificant** – These impacts are typically short- to medium-term impacts under any context or intensity. Beneficial impacts that are not significant in nature may include restoration of small pockets of wetlands. Adverse but not significant impacts are typically recoverable over the short-to-medium term with mitigations required to minimize level of impact or potential for impact, the extent of mitigation dependent on the identified context and intensity of the impact. Examples of adverse impacts that are not significant may be short, intermittent increases in noise to transient recreational users that do not affect overall usability of the forest or the potential for localized, intermittent soil erosion on stream banks due to troop movement over the land-water interface during dismounted movements and amphibious operations. These are recoverable impacts over the short term through Proposed Resource-Specific Mitigations to avoid noise-sensitive areas for training in the case of noise impacts and, for soil impacts, minimizing the size of troop units conducting ground training activities, rotating land-water interface ingress/egress points, and not using ingress/egress points that show signs of erosion.
- **Neutral or No Effect** – These are impacts that are typically of a low-intensity, such that they are imperceptible regardless of context or duration. Such impacts, whether beneficial or otherwise, are recoverable over the short term without mitigation and result in no overall perceptible change to the resource. Resources experiencing neutral or no effects are identified as “green” in Table ES-21.

Impacts were evaluated with consideration of implementation of General Operational Constraints inherent to the Proposed Action associated with EAFBI operational procedures and other NEPA-related documents for similar actions occurring on the Eglin Range on similar resources. General Operational Constraints are a prerequisite for implementing the Proposed Action. Once analyses were completed, additional Proposed Resource-Specific Mitigations were identified to avoid or minimize adverse impacts to relatively impacted resources.

Overall, the Air Force has not identified any significant beneficial or significant adverse impacts associated with the Proposed Action or Subalternative 1. While the Air Force has identified the potential for adverse impacts to various resources, these impacts would be insignificant based on the context, intensity and duration of the identified impacts as described throughout Chapters 3, 4, 5, and 6. Impacts to public health and safety would be either avoided or minimized through implementation of operational constraints and mitigations. Any unique geographic characteristics (e.g., sensitive habitats, areas prone to erosion, etc.) associated with the proposed emitter or training sites would be avoided, and any potential adverse impacts to the quality of the human environment would be minimal (mainly the potential for occasional annoyance to recreational users from noise). There are no unknown risks or impacts that may be considered controversial in nature associated with emitter site use or training activities.

(such actions have been extensively analyzed in this EIS and other Air Force documents as referenced in this EIS), and the Proposed Action or Subalternative 1 is not precedent setting because the DoD utilizes public lands throughout the United States for both emitter sites and military training. Adverse impacts to cultural resources and endangered species have been identified; however, these impacts would also be minimized/mitigated through implementation of operational constraints and mitigations as identified through consultation under the National Historic Preservation Act and the Endangered Species Act, respectively. Additionally, the use of emitter sites and conduct of training activities would comply with all federal, state, and local laws. Finally, the Air Force has not identified any significant potential for cumulative impacts (as discussed in Chapter 7). Therefore, based on the context, intensity, and duration of impacts identified in this EIS the Air Force has not identified significant beneficial or adverse impacts under the Proposed Action or Subalternative 1. Additionally, by virtue of the reduced scope of Subalternative 1 (i.e., reduced frequency, location, and number of proposed activities) impacts would be less than those identified under the Proposed Action.

More detail on impacts can be found in the respective resource-specific discussions provided in the associated EIS sections identified in Table ES-21.

**Table ES-21. Summary of Impacts and Associated Location in EIS**

Resource Area	Proposed Action			No Action
	Emitter Sites	Blackwater River State Forest	Tate's Hell State Forest	
Airspace	Sections 3.2/4.2	Sections 3.2/5.2	Sections 3.2/6.2	Chapter 8
Noise	Sections 3.3/4.3	Sections 3.3/5.3	Sections 3.3/6.3	
Safety	Sections 3.4/4.4	Sections 3.4/5.4	Sections 3.4/6.4	
Air Quality	Sections 3.5/4.5	Sections 3.5/5.5	Sections 3.5/6.5	
Earth Resources	Sections 3.6/4.6	Sections 3.6/5.6	Sections 3.6/6.6	
Water Resources	Sections 3.7/4.7	Sections 3.7/5.7	Sections 3.7/6.7	
Biological Resources	Sections 3.8/4.8	Sections 3.8/5.8	Sections 3.8/6.8	
Cultural Resources	Sections 3.9/4.9	Sections 3.9/5.9	Sections 3.9/6.9	
Land Use	Sections 3.10/4.10	Sections 3.10/5.10	Sections 3.10/6.10	
Socioeconomics/ Environmental Justice	Sections 3.11/4.11	Sections 3.11/5.11	Sections 3.11/6.11	
Hazardous & Solid Materials/Waste	Sections 3.12/4.12	Sections 3.12/5.12	Sections 3.12/6.12	
Infrastructure/ Transportation	Sections 3.13/4.13	Sections 3.13/5.13	Sections 3.13/6.13	
Subalternative 1				
Airspace	Sections 3.2/4.2	Sections 3.2/5.2	Sections 3.2/6.2	Chapter 8
Noise	Sections 3.3/4.3	Sections 3.3/5.3	Sections 3.3/6.3	
Safety	Sections 3.4/4.4	Sections 3.4/5.4	Sections 3.4/6.4	
Air Quality	Sections 3.5/4.5	Sections 3.5/5.5	Sections 3.5/6.5	
Earth Resources	Sections 3.6/4.6	Sections 3.6/5.6	Sections 3.6/6.6	
Water Resources	Sections 3.7/4.7	Sections 3.7/5.7	Sections 3.7/6.7	

**Table ES-21. Summary of Impacts and Associated Location in EIS, Cont'd**

Subalternative 1 Cont'd				
Resource Area	Emitter Sites	Blackwater River State Forest	Tate's Hell State Forest	No Action
Biological Resources	Sections 3.8/4.8	Sections 3.8/5.8	Sections 3.8/6.8	Chapter 8
Cultural Resources	Sections 3.9/4.9	Sections 3.9/5.9	Sections 3.9/6.9	
Land Use	Sections 3.10/4.10	Sections 3.10/5.10	Sections 3.10/6.10	
Socioeconomics/ Environmental Justice	Sections 3.11/4.11	Sections 3.11/5.11	Sections 3.11/6.11	
Hazardous & Solid Materials/Waste	Sections 3.12/4.12	Sections 3.12/5.12	Sections 3.12/6.12	
Infrastructure/ Transportation	Sections 3.13/4.13	Sections 3.13/5.13	Sections 3.13/6.13	

The Air Force completed consultation with the United States Fish and Wildlife Service (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA) on April 8, 2014, and has received concurrence on a finding of Not Likely to Adversely Affect sensitive species or habitat (USFWS, 2014). The Air Force has completed consultation with the Florida State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American tribes in accordance with Section 106 of the National Historic Preservation Act (NHPA); a Programmatic Agreement outlines requirements associated with cultural resources protection and mitigation. A list of agencies and tribes contacted is provided in EIS Appendix B, *Public and Agency Involvement*, while ESA and NHPA consultation documentation and the Programmatic Agreement is provided in EIS Appendix C, *Consultation Documentation*. All completed NHPA consultation documents, including responses and findings from cultural resource consultation agencies, is provided in the Final EIS.

## **ES.6. NO ACTION ALTERNATIVE IMPACT ANALYSIS**

Implementation of the No Action Alternative means that none of the Proposed Action components as described in Sections 4.1.1 and 4.1.2 would occur at the respective locations (emitter sites, BRSF, and THSF). All activities would remain on Eglin AFB, and no new emitter sites would be established. There would be no impacts to the proposed emitter sites, BRSF, or THSF beyond those resulting from normal activities at these locations, such as recreational use and typical forest management activities conducted by the FFS as identified in the respective state forest management plans. Evaluation of the impacts of these activities on the affected environment is beyond the scope of this EIS.

Impacts to the Eglin Range and associated airspace would be as described in the *Eglin AFB Final Interstitial Range Environmental Assessment Revision 2* (U.S. Air Force, 2013c), the *Eglin AFB Riverine/Estuarine Final Programmatic Environmental Assessment* (U.S. Air Force, 2004), and the *Eglin AFB Final Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force, 2006).



## **ES.7. PROPOSED RESOURCE-SPECIFIC MITIGATIONS**

Based on the scope of activities associated with the Proposed Action, the inherent General Operational Constraints identified in Section 2.5 of the EIS, and related impact analyses detailed in the EIS, there are no identified Resource-Specific Mitigation impact minimization procedures necessary for the following resource areas: air quality, solid/hazardous materials and waste, and infrastructure and transportation. The identified mitigations would be incorporated into a Mitigation Plan, which would be a “living document” that would be reviewed and updated as required on an annual basis by the GLI Liaison and Landscape Implementation Team to ensure mitigation applicability and effectiveness.

Impact analysis of the Proposed Action has identified Proposed Resource-Specific Mitigations that would be implemented, in addition to General Operational Constraints in EIS Section 2.5, to further minimize or avoid adverse impacts for the following resources: airspace management, noise, earth resources, water resources, biological resources, safety, and land use. These Proposed Resource-Specific Mitigations are detailed in Section 2.7 of the EIS. In most cases impacts would be minimized such that impact significance levels would be reduced from “adverse” (yellow) to “neutral” or “no effect” (green) in Table ES-21.

## **ES.8. CUMULATIVE IMPACTS**

Cumulative effects analysis considers the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). In this EIS, the Air Force has made an effort to identify actions on or near the action areas associated with the Proposed Action that are under consideration and in the planning stage at this time.

The Air Force evaluated the potential for significant cumulative impacts associated with the Proposed Action. No unmitigatable adverse impacts have been identified for use of emitter sites, thus the Air Force has not identified any correlating potential for cumulative impacts from emitter site use. Although the Proposed Action would result in incremental impacts when associated with identified past, present, and reasonably foreseeable future actions at BRSF and THSF, the Air Force does not expect the Proposed Action to result in any significant adverse cumulative impacts.

## **ES.9. OTHER NEPA CONSIDERATIONS**

### **ES.9.1 Relationship Between Short-term Use and Long-term Productivity**

#### ***Short-Term Uses***

The Proposed Action would have minor short-term effects related to use of resources during land improvements in support of LZs, consumptive use, traveling, use of produced materials, fuels, etc. As a mitigating component of short-term uses of the environment, the Proposed Action would create economic benefits during training

activities in the form of some jobs and the direct and indirect demand for goods and services.

### ***Long-Term Productivity***

Based on analysis of the Proposed Action, the Air Force has not identified any long-term adverse impacts to productivity as a result of unmitigated short-term impacts. The Proposed Action would result in short-term increases in direct and indirect demand for goods and services while training activities occur. Impacts would be intermittent over the long term as the GLI program is established and implemented. Long-term benefits to the FFS associated with lease fees would be realized through leasing agreements.

### ***Short-Term Uses Versus Long-Term Productivity***

The assessment of effects on long-term productivity is related to whether the project is consistent with long-term regional and local planning objectives. Under the Proposed Action, there would be minor increases in employment, income, and net fiscal benefits and revenues to the FFS and surrounding communities during training activities. Training activities at the state forests would be scheduled to avoid conflict with hunters and other recreational users, thus avoiding impacts to long-term productivity associated with recreational use of the forests.

## **ES.9.2 Irreversible and Irretrievable Commitment of Resources**

NEPA requires that environmental analysis identify any irreversible and irretrievable commitments of resources involved in the implementation of the Proposed Action or alternatives. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Implementing the Proposed Action would require a commitment of natural, physical, human, and fiscal resources. In all of these categories, irreversible and irretrievable commitments of resources would occur in the form of utilization of energy resources such as fossil fuels (for transportation, associated with utility use, etc.). While none of the proposed activities involve direct habitat alteration, some biological resources would be directly lost as a result of consumptive use during training activities; however, no sensitive species would be impacted, and the amount of general wildlife species taken would be insignificant when compared with the amount of hunting taking place at each proposed location. Incidental contact (such as a vehicle strike) may also result in incidental mortality to some species; while this cannot be completely avoided, the potential can be minimized by implementation of the General Operational Constraints and Proposed Resource-Specific Mitigations identified in the EIS.

### **ES.9.3 Energy Requirements and Conservation Potential of Alternatives and Mitigation Measures**

Energy requirements associated with the Proposed Action are limited to use of fossil fuels in support of transportation and utility use. Conservation potential for this resource is limited to general energy conservation techniques, such as making sure no lights remain on at hardened camp sites, transportation pooling, etc.

### **ES.9.4 Natural or Depletable Resource Requirements and Conservation Potential**

While use of natural resources as a component of the training environment would occur at each forest (e.g., consumption training), use of natural resources for the Proposed Action is expected to be “nonintrusive,” in the sense that the goal of the Air Force in implementing the Proposed Action is to avoid to the greatest extent possible adverse impacts to natural and anthropogenic resources and to be compatible with FFS forest management plans. To this end, the Air Force has developed General Operational Constraints and Proposed Resource-Specific Mitigations to avoid or minimize impacts on the environment. Consequently, the Air Force would support conservation measures of the FFS through implementation of these requirements. Other than use of fossil fuels as discussed previously, there are no requirements for depletable resources associated with the Proposed Action.

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## ACRONYMS AND ABBREVIATIONS

<b>1 SOG/OGO</b>	1st Special Operations Group/Current Operations Office
<b>7 SFG(A)</b>	7th Special Forces Group (Airborne)
<b>96 CEG/CEIEA</b>	96th Civil Engineer Group/Environmental Assets
<b>96 CEG/CEIEC</b>	96th Civil Engineer Group/Compliance Branch
<b>A/C</b>	aircraft
<b>A/LVL</b>	Air/Land Vertical Lift
<b>AACI</b>	Air Armament Center Instruction
<b>ACAM</b>	Air Conformity Applicability Model
<b>ACHP</b>	Advisory Council on Historic Preservation
<b>ACS</b>	American Community Survey
<b>AD</b>	Airdrop
<b>AFB</b>	Air Force Base
<b>AFDT</b>	Air Force Development Test
<b>AFDTC</b>	Air Force Development Test Center
<b>AFI</b>	Air Force Instruction
<b>AFOSH</b>	Air Force Occupational and Environmental Safety, Fire Protection, and Health
<b>AFSOC</b>	Air Force Special Operations Command
<b>AGL</b>	above ground level
<b>AICUZ</b>	Air Installation Compatible Use Zone
<b>Air Force</b>	United States Air Force
<b>Amph</b>	Amphibious
<b>AO</b>	Amphibious Operations
<b>AOC</b>	area of concern
<b>APE</b>	Area of Potential Effects
<b>AQCR</b>	Air Quality Control Region
<b>ARTCC</b>	air route traffic control center
<b>ATC</b>	air traffic control
<b>ATV</b>	all-terrain vehicle
<b>B.C.</b>	before Christ
<b>B/AA</b>	Bivouacking/Assembly Areas
<b>BD</b>	Blackout Driving
<b>BEPA</b>	Bald Eagle Protection Act
<b>BFC</b>	Blackwater Forestry Center
<b>BMP</b>	best management practice
<b>BMU</b>	Bear Management Unit
<b>BNOISE2™</b>	large arms noise assessment model
<b>BRSF</b>	Blackwater River State Forest
<b>C</b>	candidate species
<b>C&amp;SO</b>	Communications and Surveillance Operations
<b>C2U</b>	command and control unit
<b>CAA</b>	Clean Air Act
<b>CCDM</b>	Cross-Country Dismounted Movement
<b>CCVM</b>	Cross-Country Vehicle Movement (now referred to as Roadway Vehicle Use, or RVU)
<b>CDNL</b>	C-weighted day–night average sound level
<b>CEQ</b>	Council on Environmental Quality
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation, and Liability Act

<b>CFR</b>	Code of Federal Regulations
<b>CH<sub>4</sub></b>	Methane
<b>CO</b>	carbon monoxide
<b>CO<sub>2</sub></b>	carbon dioxide
<b>CO<sub>2</sub>e</b>	carbon dioxide equivalent
<b>COC</b>	community of comparison
<b>CTIT</b>	turbine inlet temperature in degrees Celsius
<b>CWA</b>	Clean Water Act
<b>dB</b>	Decibels
<b>dBA</b>	A-weighted decibels
<b>dBC</b>	C-weighted decibels
<b>DHR</b>	Division of Historical Resources
<b>DJJ</b>	Department of Juvenile Justice
<b>DM</b>	Dismounted Maneuvers
<b>DNL</b>	day-night average sound level
<b>DNL<sub>mr</sub></b>	onset rate-adjusted monthly DNL
<b>DoD</b>	Department of Defense
<b>DoDI</b>	Department of Defense Instruction
<b>DOF</b>	Division of Forestry
<b>DZ</b>	drop zone
<b>DZC</b>	drop zone controller
<b>EAFBI</b>	Eglin Air Force Base Instruction
<b>EED</b>	electro explosive device
<b>EIAP</b>	Environmental Impact Analysis Process
<b>EIS</b>	Environmental Impact Statement
<b>EMF</b>	Electro-Magnetic Frequency
<b>EMR</b>	electromagnetic radiation
<b>EO</b>	Executive Order
<b>EoO</b>	Emplacement of Obstacles
<b>EPCRA</b>	Emergency Planning and Community Right-to-Know Act
<b>ERCF</b>	Eglin Radar Control Facility
<b>ERPL</b>	Environmental Restrictions Planning Level
<b>ERTT</b>	Environmental Restrictions Tracking Tool
<b>ESA</b>	Endangered Species Act
<b>ETR</b>	engine thrust request
<b>F.S.</b>	Florida Statutes
<b>FAA</b>	Federal Aviation Administration
<b>FAC</b>	Florida Administrative Code
<b>FACSFAC</b>	Fleet Area Control and Surveillance Facility
<b>FARP/HGO</b>	Forward Air Refueling Point/Hot Gas Operations
<b>FDACS</b>	Florida Department of Agriculture and Consumer Services
<b>FDEP</b>	Florida Department of Environmental Protection
<b>FDI</b>	Fire Danger Index
<b>FDOF</b>	Florida Division of Forestry
<b>FFS</b>	Florida Forest Service
<b>FHWA</b>	Federal Highway Administration
<b>FNAI</b>	Florida Natural Areas Inventory
<b>FPPA</b>	Farmland Protection Policy Act
<b>FS</b>	Forestry Site

<b>FWALS</b>	Fixed-Wing Aircraft Landing Sites
<b>FWC</b>	Florida Fish and Wildlife Conservation Commission
<b>FWPCA</b>	Federal Water Pollution Control Act
<b>GBS</b>	ground burst simulator
<b>GHG</b>	greenhouse gas
<b>GLI</b>	GRASI Landscape Initiative
<b>GOC</b>	General Operational Constraint
<b>GPS</b>	global positioning system
<b>GRASI</b>	Gulf Regional Airspace Strategic Initiative
<b>GWP</b>	global warming potential
<b>HCSU</b>	Hardened Camp Site Use
<b>HFC</b>	hydrofluorocarbon
<b>HMMWV</b>	high-mobility multipurpose wheeled vehicle
<b>Hp</b>	horsepower
<b>IADS</b>	integrated air defense system
<b>IFF</b>	Identification, Friend or Foe
<b>IFR</b>	instrument flight rule
<b>IICEP</b>	Intergovernmental Coordination for Environmental Planning
<b>IR</b>	instrument route
<b>ISD</b>	incidental surface disturbance
<b>JO</b>	Job Order
<b>JTE</b>	joint threat emitter
<b>KBDI</b>	Keetch-Byrum Drought Index
<b>KIAS</b>	knots indicated airspeed
<b>KTM</b>	Kineto Tracking Mount
<b>kts</b>	knots
<b>L.I.T.</b>	Landscape Implementation Team
<b>LAPT</b>	Light Aviation Proficiency Training
<b>LD</b>	Land Development
<b>LE</b>	listed endangered
<b>LFO Lite</b>	helicopter in level flight
<b>LLH/E</b>	Low-Level Helicopter Insertions/Extractions
<b>LOS</b>	line of sight
<b>LT</b>	listed threatened
<b>LU-1</b>	Limited Use-1
<b>LU-2</b>	Limited Use-2
<b>LZ</b>	landing zone
<b>LZ</b>	landing zone
<b>LZC</b>	Landing Zone Controller
<b>MACA</b>	Mid-Air Collision Avoidance
<b>MCM</b>	Mobile Cinetheodolite Mount
<b>mm</b>	millimeter
<b>MMPA</b>	Marine Mammal Protection Act
<b>MOA</b>	military operations area
<b>mph</b>	miles per hour
<b>MSL</b>	mean sea level
<b>MTR</b>	military training route
<b>mW/cm<sup>2</sup></b>	milliwatt per square centimeter
<b>N</b>	not federal status
<b>N/A</b>	not applicable

<b>N<sub>2</sub>O</b>	nitrous oxide
<b>NAAQS</b>	National Ambient Air Quality Standards
<b>NAGPRA</b>	Native American Graves Protection and Repatriation Act
<b>NAS</b>	Naval Air Station
<b>NEI</b>	National Emissions Inventory
<b>NEPA</b>	National Environmental Policy Act
<b>NF</b>	fan speed
<b>NHPA</b>	National Historic Preservation Act
<b>NM</b>	nautical miles
<b>NOISEMAP</b>	environmental noise mapping software
<b>NOLF</b>	Naval Outlying Landing Field
<b>NOTAM</b>	Notice to Airmen
<b>NO<sub>x</sub></b>	nitrogen oxide
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NRC</b>	Natural Resource Consumption
<b>NRHP</b>	National Register of Historic Places
<b>NVG</b>	night vision goggle
<b>NWFWMD</b>	Northwest Florida Water Management District
<b>O/Eq.</b>	Other/Equipment
<b>°F</b>	degrees Fahrenheit
<b>OFVO</b>	opposing forces vehicle operations
<b>OFW</b>	Outstanding Florida Water
<b>OHO</b>	Overwater Hoist Operations
<b>OLF</b>	outlying landing field
<b>Ops</b>	operations
<b>OSA</b>	Occupational Safety and Health Act
<b>OSHA</b>	Occupational Safety and Health Administration
<b>PEL</b>	permissible exposure limit
<b>PFC</b>	perfluorocarbons
<b>PI</b>	point impacts
<b>PK 15(met)</b>	peak level exceeded only 15 percent of the time
<b>PK(met)</b>	peak noise levels
<b>PM</b>	particulate matter
<b>PM<sub>10</sub></b>	particulate matter with a diameter of 10 microns or less
<b>PM<sub>2.5</sub></b>	particulate matter with a diameter of 2.5 microns or less
<b>POC</b>	point of contact
<b>POL</b>	petroleum, oil, and lubricants
<b>RA</b>	restricted area
<b>RAPCON</b>	radar approach control
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>RCW</b>	red-cockaded woodpecker
<b>REA</b>	Range Environmental Assessment
<b>RF</b>	radio frequency
<b>RNM</b>	Rotorcraft Noise Model
<b>ROCC</b>	Range Operations Control Center
<b>ROI</b>	region of influence
<b>RPM</b>	revolutions per minute
<b>RUSLE</b>	Revised Universal Soil Loss Equation
<b>RVU</b>	Roadway Vehicle Use

<b>SAF/IEI</b>	Air Force Deputy Assistant Secretary for Installations
<b>SARNAM</b>	Small Arms Range Noise Assessment Model
<b>SATB</b>	simulated airdrop training bundle
<b>SEL</b>	sound exposure level
<b>SHD</b>	safety hazard distance
<b>SHPO</b>	State Historic Preservation Officer
<b>SO<sub>2</sub></b>	sulfur dioxide
<b>SOH</b>	Safety and Occupational Health
<b>SOP</b>	standard operating procedure
<b>SPCC</b>	Spill Prevention, Control, and Countermeasures
<b>SR</b>	State Road
<b>SRYA</b>	Santa Rosa Youth Academy
<b>SS</b>	sacred sites
<b>SSC</b>	species of special concern
<b>SSHA</b>	systems safety hazard analysis
<b>ST</b>	state population listed as threatened by Florida Fish and Wildlife Conservation Commission
<b>STOP</b>	Short-Term Offender Program
<b>SUA</b>	special use airspace
<b>SUV</b>	sport utility vehicle
<b>TA</b>	tactical area
<b>TCP</b>	traditional cultural properties
<b>TCSA</b>	Temporary Combat Support Area
<b>TEU</b>	threat emitter unit
<b>TFC</b>	Tallahassee Forestry Center
<b>THSF</b>	Tate's Hell State Forest
<b>TRACON</b>	traffic control
<b>TRI</b>	Toxics Release Inventory
<b>U.S.</b>	United States
<b>UoEX</b>	use of expendables
<b>USACE</b>	U.S. Army Corps of Engineers
<b>USC</b>	United States Code
<b>USEPA</b>	U.S. Environmental Protection Agency
<b>USFS</b>	U.S. Forest Service
<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>UST</b>	underground storage tank
<b>Ut.</b>	Utilities
<b>UTBNI</b>	up to, but not including
<b>UXO</b>	unexploded ordnance
<b>VFD</b>	volunteer fire department
<b>VFR</b>	visual flight rule
<b>VOC</b>	volatile organic compound
<b>VORTAC</b>	Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid
<b>VSWC</b>	Vehicle Stream and Wetland Crossing (now a part of Roadway Vehicle Use, or RVU)
<b>WFPM</b>	Wildland Fire Program Manager
<b>WMA</b>	Wildlife Management Area



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## 1. PURPOSE AND NEED

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### 1.1 INTRODUCTION

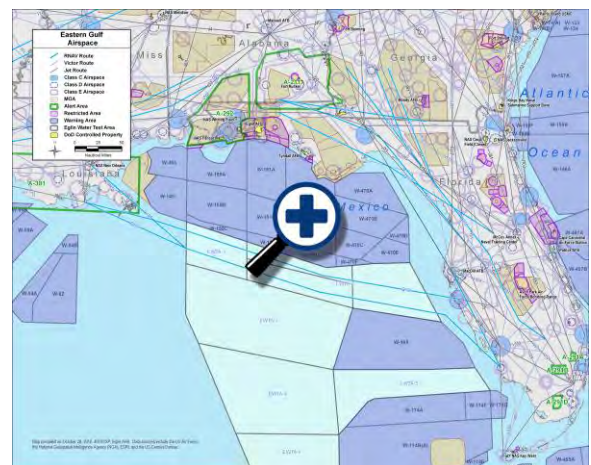
This Environmental Impact Statement (EIS) has been prepared in accordance with the National Environmental Policy Act (NEPA) to analyze the potential environmental consequences of the proposed Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative (GLI) in northwest Florida.<sup>1</sup>

This chapter provides background information on the GRASI planning process. It also discusses the purpose and need for the Proposed Action, the Environmental Impact Analysis Process (EIAP), cooperating agencies, consultations and coordination, decisions to be made, and the scope and format of the EIS.

### 1.2 BACKGROUND, SCOPE, AND HISTORY OF GRASI PLANNING

The GRASI region consists of the eastern Gulf of Mexico region, which includes northwest Florida, southern Mississippi, lower Alabama, southern Georgia, and the eastern Gulf of Mexico. The region’s major industries include defense and tourism. Six major Department of Defense (DoD) installations call the area home: Eglin AFB, Tyndall AFB, Naval Air Station (NAS) Pensacola, Fort Rucker, Hurlburt Field, and NAS Whiting Field. The 2005 Base Realignment and Closure Act recommendations (which became law on November 9, 2005) assigned F-35 Joint Strike Fighters to Eglin AFB, realigned the 7th Special Forces Group (Airborne) (7 SFG[A]) to Eglin AFB, moved additional aviation training to NAS Pensacola, relocated the Defense Threat Reduction Agency National Command Region conventional armament research from Fort Belvoir, Virginia, and created an Air Integrated Weapons and Armaments Research, Development and Acquisition, Test and Evaluation Center at Eglin AFB. Further, installations across the region expect growth of preexisting missions and an increase in student populations and training readiness activities.

Each base has a need to fly around its airfields and within special use airspace (SUA), as well as transit regularly between both areas to accomplish its mission ([Figure 1-1](#)). SUA is a designated volume of airspace that segregates incompatible



**Figure 1-1. GRASI Regional Airspace**

<sup>1</sup> NOTE: This document is meant to be an electronic, interactive document, and all maps are identified as thumbnails within the text; clicking on the image will enlarge it for screen viewing. Those wishing to print the document will find full page maps in Appendix A.

military operations from civilian air traffic by limiting access for aircraft not participating in the military operations. SUA includes restricted areas (RA), military operations areas (MOAs), alert areas, and warning areas, each characterized by unique requirements for “nonparticipating” aircraft. RA that extends to the ground over a military range allows for the release of munitions from an aircraft for testing and training.

Regional growth is not limited to the military; since 1990, the population of the Florida panhandle has increased dramatically. Traffic counts at airports across the region have also steadily risen, and Bay County recently saw the opening of the first international airport (Northwest Florida Beaches International Airport) built in the last decade. Because civilian flights require access to safe and navigable airspace, commercial carriers could decide to relocate or reduce operations if the airspace over the region becomes too congested. Businesses that rely on general aviation and business aviation traffic could compete with increased military use.

Military planners at Eglin AFB realized that the region needed a strategic vision and a coordinated approach to optimize use of the airspace to better support regional and civilian needs. The GRASI is a collaborative planning effort between military and civilian leaders designed to ensure the future availability and capacity of regional airspace and training lands for military use and the continued economic prosperity of the Gulf Coast. Beginning in March 2008, the DoD began to discuss plans to address regional training constraints and capacity shortfalls. Eglin AFB initially brought together military stakeholders to conduct a requirements analysis of current and future projected training requirements. Participants in this requirements analysis included members of the 7 SFG(A), Air Force Special Operations Command (AFSOC), the Navy, and representatives familiar with training needs of the F-35 Joint Strike Fighter. DoD stakeholders documented their training requirements, established a strategic vision, modeled all the airspace in the region, and recorded objectives, which were developed in conjunction with civilian community leadership, for stakeholders to implement.

The requirements analysis showed that additional airspace capacity is needed to support greater levels of military training and testing, which are expected to increase through 2017. Without better management and use of airspace to provide additional capacity, the military mission will not be sustainable in the Gulf Coast region. The GRASI established multiple objectives, including adding high-altitude military airspace, rerouting traffic during busy periods, improving management facilities and communication, and expanding the military capacity of the region. The entire GRASI planning process, goals, objectives, and strategies are in the *GRASI Strategic Plan*, at <http://grasi.leidoseemq.com>.

The GRASI airspace model showed that demand on the military RA is the limiting factor on the growth of testing and training activity. Further, many of the activities planned or conducted in the RA are tied to nonhazardous ground activities that need not occur on a range. These activities could be safely conducted outside of range property and SUA. These nonhazardous activities require only a small ground party or equipment, but without permission to access other areas, DoD has had to conduct these activities in range and airspace reserved for hazardous missions. To alleviate congestion in RA, the United States Air Force (Air Force) decided to partner with willing public and private

owners of large land parcels (over 10,000 acres) to investigate the potential for military use.

DoD began the GLI with two strategies: partner with nongovernmental organizations, states, and federal agencies to gain access to new working lands and partner with owners of existing working lands to investigate the potential for military use. DoD began by reviewing all activities conducted in the limiting RA and documented the numbers and types of operations that are or will be overtaking the airspace.

In 2012, military planners began to identify potential civilian partner organizations that might have the capability and interest in supporting the military mission. In February 2012, military planners began reaching out to state and local organizations. Several state agencies, such as the Florida Forest Service (FFS), Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Environmental Protection (FDEP), and Northwest Florida Water Management District (NFWFMD) expressed interest in supporting the DoD's need to augment training and testing capabilities. Between October 2012 and March 2013, each of these organizations signed a Memorandum of Agreement with the Air Force committing to explore solutions and alternatives for meeting the DoD's requirements for additional training land and airspace (see Appendix I, *Memoranda of Agreement*). It should be noted that the Air Force has not limited the pursuit of potential GLI partnership opportunities to just Florida State agency partners. The Air Force has also reached out to federal partners such as the U.S. Forest Service (USFS), who appeared to have lands that might be compatible with DoD training needs. In 2013 and 2014 the Air Force contacted the USFS to determine the agency's interest in establishing a GLI partnership. The USFS indicated that they were not willing to enter into a GLI partnership at that time at either Conecuh or Apalachicola National Forest.

The Memorandum of Agreement between the Air Force and FFS is consistent with the recent legislative amendment to the Cooperative Forestry Assistance Act, which authorizes funding for state forestry agencies. In February 2014, 16 United States Code (USC) Section 2101a(c) was amended by Public Law 113-79, Section 8101. Under this amendment, state foresters develop or update statewide assessments and strategies in coordination, as feasible, with military installations to support, promote, and contribute to their mission activities. In the planning and implementation of the GLI, the Air Force will work with FFS to accomplish this coordination requirement by evaluating the potential participation and management of state-owned forestlands to support compatible military training activities for Eglin AFB. The Proposed Action in this EIS demonstrates the initiative taken by FFS to support, promote, and contribute to the mission of Eglin AFB.

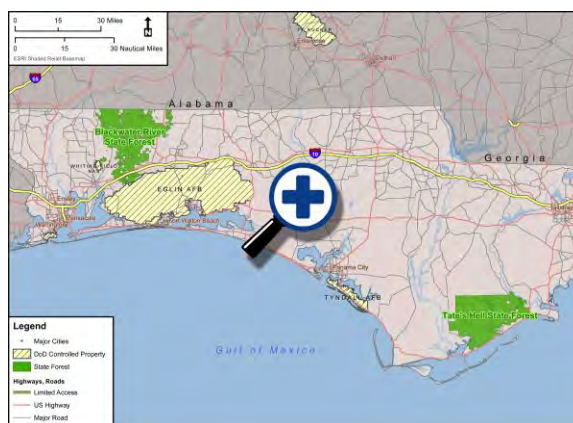
The scope of this EIS addresses the Proposed Action that could be pursued under the current GRASI planning process within the construct of the established agreements. This GLI EIS, therefore, evaluates the environmental impacts of the Proposed Action that is ready for decision on FFS, FWC, FDEP, or NFWFMD lands that meet the military's GRASI training needs, namely, establishment and use of emitter training sites and training activities in Blackwater River State Forest (BRSF) and Tate's Hell State Forest (THSF).

Emerald Warrior (AFSOC training in urban and irregular warfare settings currently occurring in northwest Florida) is not included as part of this Proposed Action. However, training activities associated with the Proposed Action, when conducted either individually or collectively, could be in support of future regional training events such as Emerald Warrior or other similar exercises when the Eglin Range capacity or capability does not exist.

### 1.3 PURPOSE

The purpose of the Proposed Action is to analyze the suitability of state lands already identified by state agencies, pursuant to memoranda of agreement under the GRASI Strategic Plan, as potentially available for siting training emitters and conducting a variety of nonhazardous military training activities to meet short-term needs. The intent of the GLI is not to establish new, dedicated-use military ranges but rather to develop additional training flexibility and diversity potentially available through established partnerships and agreements for use when training flexibility at existing military bases is not available. The intent of the GLI, therefore, is to provide military units with compatible locations that can serve as an outlet for training activities when they are otherwise unable to meet their requirements using current military training areas. The Air Force proposes to pursue this increased flexibility through the GRASI planning process and the partnership agreements with state agencies established in 2012 and 2013. It is hoped that additional partnerships may be established and other areas identified as potential training sites in the future.

Specifically, this Proposed Action (the GLI, a component of the GRASI) is designed to develop additional regional training flexibility for nonhazardous military operations. This would be accomplished through two types of partnerships. The Air Force would partner with the State of Florida to obtain permits to use lands that the state has already identified as potentially available for training: BRSF and THSF ([Figure 1-2](#)). In addition, the Air Force would partner with FFS and FWC for use of associated lands for placement of temporary and mobile training radar emitters. Because complete implementation of these two partnerships may not add sufficient regional flexibility, the Air Force will continue to pursue and cultivate additional partnerships with other agencies. Such future actions, if and when agreed to and defined in sufficient detail for NEPA analysis, would be evaluated at the appropriate level under separate NEPA documentation.

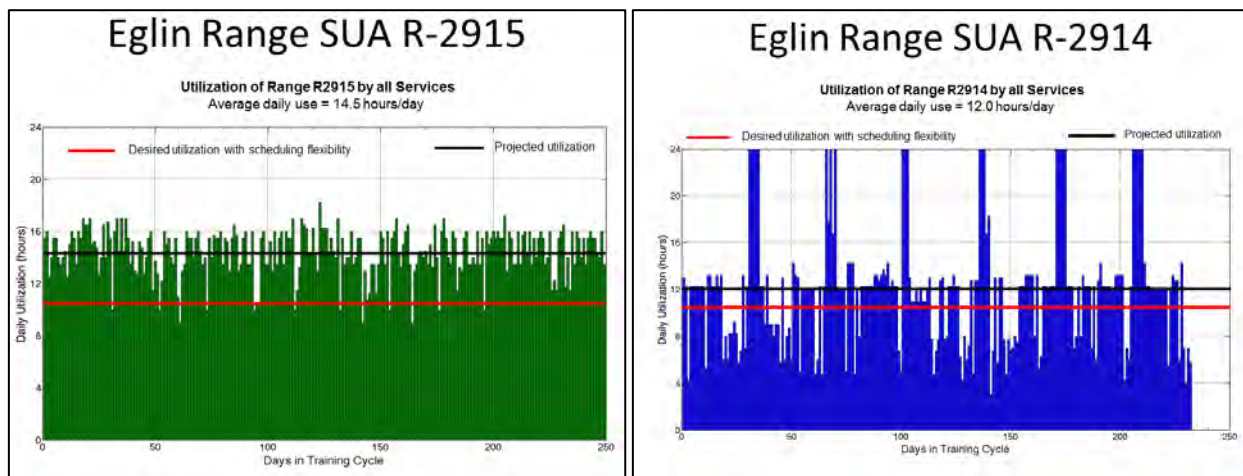


**Figure 1-2. Location of BRSF and THSF**



## 1.4 NEED

The Proposed Action is needed because there is a projected regional shortfall of military training and testing land and airspace in the GRASI region. The demand for the land range and use of RA over the Eglin Range Complex creates scheduling conflicts for nonhazardous training. The 96th Test Wing manages the Eglin Range to optimally schedule training and test activities. When testing activities for new aircraft and weapons systems occur, hundreds of thousands of acres of Eglin's range must be closed to training uses. Eglin AFB balances these training and testing mission requirements using a robust prioritization and scheduling process. This process allows Eglin AFB to meet the demands for those activities that the range has the capacity to support. When requested mission activities exceed the range's capabilities and capacity, additional training space is needed for compatible, nonhazardous mission activities. The Proposed Action is designed to provide an outlet for training only when the existing range space cannot accommodate training needs. [Figure 1-3](#) provides a graphical representation of the capacity issues for Eglin's SUA overlying the Eglin Range that are driving the need for the Proposed Action. The charts show the projected average daily use in hours (black horizontal lines) of two SUA units during the yearly training cycle compared with the desired level of use (red horizontal lines) that would provide flexibility in scheduling range activities. These graphs show that projected average daily use is expected to exceed the desired level of use and negatively affect the Range's capacity.



**Figure 1-3. Capacity Issues Driving the Need for the Proposed Action**

Obtaining the necessary permits to use new areas for nonhazardous training and placing training emitters in remote locations would create flexibility, improving training outcomes through more scheduling options and reducing the competing demands on RA. Eglin AFB's primary mission is test and evaluation, and training activities sometimes have a lower priority. From time to time, training units are unable to obtain the necessary time on the range or in the RA to complete their requirements. As a result, the Air Force needs additional flexibility in the GRASI region to accommodate the increasing levels of testing and training activity required by current and future mission demands. More specifically, additional flexibility for training activities outside Eglin AFB

would allow test and training units to accomplish their missions when time on the range or in the RA is not available.

As a result, the Air Force needs additional land areas in the GRASI region to accommodate the increasing levels of testing and training activity required by current and future mission demands. More specifically, additional capacity for training activities outside of the Eglin Range Complex would allow all testing and training units at Eglin AFB to accomplish their missions. Obtaining the necessary permits to use new areas for nonhazardous training that are in proximity to units currently training on Eglin's Range Complex, as well as placing training emitters in additional locations, would create flexibility and reduce the demand on RA. These measures would allow some mission activities a place to operate when the airspace is already being used by other mission activities. Emitter sites create realistic threat scenarios for pilots and more realistic training scenarios by simulating an integrated air defense system (IADS), which helps with identifying and countering enemy missile or artillery threats from land or sea.

In summary, by gaining permitted access to the GRASI landscape (i.e., implementing the GLI), military units would gain much needed flexibility when the land range and RA are not available. Furthermore, they would be able to train in a realistic threat environment that would resemble actual combat scenarios.

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## 1.5 DECISION TO BE MADE

For purposes of this EIS, the decision to be made by the Air Force is whether or not to request permitted/leased access to GLI partner lands for purposes of siting training emitters and/or conducting training activities under conditions and limitations described in this EIS. The scope of these activities is described under the Proposed Action, Subalternative 1, and the No Action Alternative; however, Air Force decision-makers could elect to request permits and authorization to use lands for some combination of activities discussed as part of these alternatives.

Air Force decision-makers have a variety of potential alternatives from which to choose, based on the different emitter and training activities and sites proposed. Each of the different emitter sites and training activities described in Chapter 2 can be selectively chosen, completely eliminated from consideration, or geographically or temporally restricted as part of eventual decisions to be made. The Air Force can therefore select from a broad spectrum of actions that are deemed compatible with current land uses and request authorization from GLI partner agencies to utilize their lands for these military uses. Once the "spectrum" of potential activities has been selected by the Air Force decision-maker from the range of alternatives, the Air Force would then submit a request for permission to conduct these activities and/or use the proposed sites. The activities and sites that will be requested by the Air Force will be identified in the Record of Decision.

The decision made by the Air Force would not directly result in the implementation of emitter use or training activities, but would result in the Air Force requesting permission via permitted use and/or lease agreements to utilize the state lands for the purposes requested. The authorization to use GLI partner lands would ultimately rest with the

state agencies (e.g., Florida Forest Service and Florida Fish and Wildlife Conservation Commission), which would determine the location and scope of activities to be permitted. GLI partner agencies can further qualify use conditions as part of the permit/lease requirements (e.g., denying certain components/activities in the Air Force's access request, dictating times and locations for certain types of testing, etc.). Depending on the uses and/or activities approved by the GLI partners and subsequent decisions by the Air Force to implement the uses and/or activities, additional environmental analysis may be conducted.

Implementation of the No Action Alternative would mean continuing all current training activities at the Eglin Range Complex using training workarounds to try to meet units' training needs to the maximum extent possible. Using training workarounds is not anticipated to meet all unit training requirements, particularly as the GRASI region becomes subject to greater demands. The decision to request authorization to utilize GLI partner lands will be made by the Air Force Deputy Assistant Secretary for Installations (SAF/IEI) or a designated signatory.

The Air Force is employing this GLI EIS process to solicit and assess public, partner, and agency feedback on the range of activities and uses within the GLI proposal and the compatibility of training with existing land uses. Because this is a proposal for partnering with other agencies, the Air Force understands how crucial this feedback is to implementing a viable proposal.

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## **1.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS**

The proposed activities addressed within this document constitute a federal action and, therefore, must be assessed in accordance with NEPA, which requires federal agencies to consider the environmental consequences of proposed actions in the decision-making process (42 USC 4321, et seq.). The intent of NEPA is to protect, restore, or enhance the environment through well-informed decisions by the federal decision maker. The Council on Environmental Quality (CEQ) was established under NEPA, 42 USC 4342, et seq., to implement and oversee federal policy in this process. In 1978, the CEQ issued regulations implementing the NEPA process under Title 40, Code of Federal Regulations (CFR), Parts 1500–1508. The Air Force EIAP for meeting CEQ requirements is accomplished via procedures set forth in CEQ regulations and 32 CFR Part 989. This EIS has been prepared in accordance with NEPA and 32 CFR Part 989.

### **1.6.1 Summary of Public Involvement Process**

NEPA and the Air Force's implementing regulations require the lead agency (in this case, the Air Force) to seek public participation throughout the EIAP, during both the scoping process and the Draft EIS public/agency review and comment process. "Scoping" identifies potential issues and alternatives early in an EIS development process; the Draft EIS public/agency review and comment process allows the public and regulatory agencies to review the Draft EIS and provide comments on the information presented in the document. As part of the public involvement process, the Air Force established a project website, <http://grasieis.leidoseemg.com>, to notify the

general public of the GLI EIS project, scoping/public hearings, and EIAP via the Internet. The website also accepted public scoping and Draft EIS review comments. A detailed discussion of the public involvement process is provided in Appendix B, *Public and Agency Involvement*.

### **Scoping**

The initiation of the scoping process began with the Air Force's publication of a Notice of Intent (NOI) in the *Federal Register* on August 12, 2013. This notice announced the Air Force's intent to prepare the GLI EIS. The publication of the NOI officially marked the beginning of the scoping period, during which time the Air Force accepted public comments on the scope, or range of issues, to be considered during the preparation of the draft EIS. The scoping period ended on September 12, 2013. The Air Force held three scoping meetings, near BRSF and THSF: Milton (August 2, 2013), Blountstown (August 28, 2013), and Apalachicola (August 29, 2013). A total of 123 persons attended the scoping meetings.

During scoping, the public provided comments at the scoping meetings or in writing to the Air Force; 167 individuals and organizations submitted scoping comments. Many of the comments concerned more than one topic and/or resource area, with the majority of comments focusing on impacts to recreation and biological resources, as well as potential socioeconomic impacts. These comments were categorized in all relevant actions/topics to ensure their full consideration during the EIS preparation. In addition, some commenters provided written as well verbal comments. Accordingly, the number of comments received is greater than the number of individuals and organizations commenting.

Additionally, to further inform the public of the Proposed Action and to allow for the public to further express concerns, the Air Force held town hall meetings in Milton and Apalachicola, Florida in December 2013. The Milton meeting, held on December 11, 2013, was attended by 131 persons and the Apalachicola meeting, held on December 12, 2013, was attended by 52 persons.

### **Draft EIS Public/Agency Review**

A Notice of Availability for the Draft EIS was published in the *Federal Register* on May 9, 2014, with associated newspaper, radio, and television announcements. After public notification, three public hearings were held in June 2014 in the following Florida communities: Carrabelle (June 3), Apalachicola (June 4), and Milton (June 5). The Air Force received 291 comment submittals from members of the public and government agencies during the public hearings and Draft EIS comment period. The majority of public comments received during the Draft EIS public review process expressed opposition to the Proposed Action, while others expressed specific concerns regarding: the need for the Proposed Action; impacts to biological resources, safety, and recreational use from noise and general disturbance; impacts to local socioeconomics; and the lack of alternatives.

The Air Force is required to respond to relevant substantive comments on a Draft EIS in the Final EIS, consistent with 40 CFR 1503.4. Generally, substantive comments are regarded as those comments that challenge the analysis, methodologies, or information

in the Draft EIS as being factually inaccurate or analytically inadequate; that identify impacts not analyzed or develop and evaluate reasonable alternatives or feasible mitigations not considered by the agency; or that offer specific information that may have a bearing on the decision, such as differences in interpretations of significance, scientific, or technical conclusions. Nonsubstantive comments, which do not require an agency response, are generally considered those comments that express a conclusion, an opinion, or a vote for or against the proposal itself, or some aspect of it; that state a position for or against a particular alternative; or that otherwise state a personal preference or opinion.

Appendix B, Volume II, provides copies of all comments received from the public and regulatory agencies during the 45-day Draft EIS review period, as well as Air Force responses to substantive comments.

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## 1.7 COOPERATING AGENCY AND INTERGOVERNMENTAL COORDINATION/CONSULTATIONS

There are no cooperating agencies associated with this action. This EIS has been developed by the U.S. Air Force in coordination with other DoD services and GRASI partner organizations, including the FFS and FWC.

In August 2013, the Air Force distributed Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) letters to potentially interested federal, state, and local agencies and government representatives. Included as an attachment to the IICEP letter was a map of the proposed emitter sites and BRSF and THSF and a flyer advertising the scoping meetings. The IICEP letter, attachments and distribution list are located in Appendix B, *Public and Agency Involvement*.

The Air Force completed consultation with the U.S. Fish and Wildlife Service (USFWS) in accordance with Section 7 of the Endangered Species Act (ESA) on April 8, 2014, and has received concurrence on a finding of “Not Likely to Adversely Affect” sensitive species or habitat (USFWS, 2014). The Air Force has notified the Florida State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American tribes in accordance with Section 106 of the National Historic Preservation Act (NHPA). A list of agencies and tribes contacted is provided in Appendix B, *Public and Agency Involvement*, while ESA and NHPA consultation documentation, including the Final Programmatic Agreement between the Air Force and the Florida SHPO is provided in Appendix C, *Consultation Documentation*.

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## 1.8 DOCUMENT FORMAT

This document consists of 13 chapters and nine appendices:

- **The Executive Summary** provides a summary of information in this EIS.
- **Chapter 1, Purpose and Need**, provides background information and identifies the purpose and need for the Proposed Action.



- **Chapter 2, Description of the Proposed Action and Alternatives**, details the Proposed Action and alternatives, discusses the alternative development process, and summarizes the potential environmental impacts associated with the Proposed Action and alternatives.
- **Chapter 3, Affected Resource Assessment**, identifies the resources potentially affected by the different components of the Proposed Action, discusses regulatory drivers and impact assessment methodologies associated with each resource area, and provides a general analysis of impacts to each resource area resulting from Proposed Action components.
- **Chapter 4, Emitter Sites Affected Environment/Environmental Consequences**, provides site-specific resource inventories and impact analyses associated with use of emitters under the Proposed Action.
- **Chapter 5, Blackwater River State Forest Affected Environment/Environmental Consequences**, provides site-specific resource inventories and impact analyses of potential impacts associated with proposed training activities at BRSF.
- **Chapter 6, Tate's Hell State Forest Affected Environment/Environmental Consequences**, provides site-specific resource inventories and impact analyses of potential impacts associated with proposed training activities at THSF.
- **Chapter 7, Cumulative Impacts**, discusses the potential cumulative impacts associated with the Proposed Action and past, present, and reasonably foreseeable future actions at BRSF, THSF, and within a regional context.
- **Chapter 8, No Action Alternative Impact Analysis**, assesses potential impacts associated with implementation of the No Action Alternative.
- **Chapter 9, Other NEPA Considerations**, discusses the relationship between short-term use and long-term productivity, irreversible and irretrievable commitment of resources, energy requirements and conservation potential of alternatives and mitigation measures, and natural or depletable resource requirements and conservation potential.
- **Chapter 10, References**
- **Chapter 11, List of Preparers**
- **Chapter 12, Index**
- **Chapter 0, Glossary**
- **Appendices**
  - Appendix A, Printable Maps
  - Appendix B, Public and Agency Involvement
  - Appendix C, Consultation Documentation
  - Appendix D, Air Quality
  - Appendix E, Earth Resources

- Appendix F, Cultural Resources
- Appendix G, NEPA Disclosure Statement
- Appendix H, Noise
- Appendix I, Memoranda of Agreement

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## 2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

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### 2.1 INTRODUCTION

The Proposed Action consists of two main components: (1) establishment and use of emitter training sites on GRASI partner lands and (2) applying to the FFS and FWC to be a permitted user of the northwest Florida state forests for nonhazardous training activities. A subalternative (Subalternative 1) is also being considered, which consists of a subset of the activities under the Proposed Action, implemented on a reduced scale. *Implementation of Subalternative 1 is the Air Force's Preferred Alternative.* The Proposed Action may not provide the most comprehensive solution for all training needs, as described in Sections [1.3](#) and [1.4](#). Should other partnerships identify additional training locations, they will be considered in conjunction with the appropriate level of additional NEPA analysis. At this time, no other suitable training locations have been identified in conjunction with GRASI partners as potentially available for use and no other elements of the GLI proposal have adequate project definition to warrant inclusion in this EIS. This chapter describes the alternative development/screening process and alternatives considered but not carried forward, details the Proposed Action and No Action Alternative, and summarizes impacts to the human and natural environment associated with the Proposed Action as identified in Chapters [3](#) through [6](#).

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### 2.2 ALTERNATIVE SCREENING PROCESS AND ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The process for identifying potential locations for emitter sites and training involved three steps: (1) identifying requirements, (2) coordination with partner agencies, and (3) evaluation of locations.

#### 2.2.1 Identifying Requirements with Selection Standards

To optimize use of public lands, land considered for the GLI must consist of existing partner lands that would be compatible with military training. The military use proposed as part of the initiative would not require full-time dedicated military land use nor would it warrant the public cost of funding a new military land acquisition.

Throughout 2011 and 2012, staff from the 96th Test Wing met with military operators (primarily AFSOC, the Joint Strike Fighter operators, and the 7 SFG) to identify basic requirements for conducting nonhazardous operations off the Eglin Range. User groups identified the types of training that would be potentially conducted under the Proposed Action, based on current operations on the Eglin Range and the requirements needed to conduct the training. The following requirements for training sites were identified: (a) sites must be located within a 1.5-hour drive (100 nautical miles) or 1-hour flight time (150 nautical miles) from Eglin AFB/Hurlburt Field to allow for day-trip training missions; (b) land area must be large enough to conduct DoD training events (preferably 15 square kilometers); (c) land must have available roads and infrastructure

for access; (d) training sites should require minimal to no improvements; (e) area must have available aircraft landing areas that require minimal to no improvements.

For radar emitters (see Section [2.3.1](#)), the following requirements (in order of importance) were identified: (a) must be within 2.5 to 3 hours driving distance from Eglin AFB to allow for day-trip mission activity and maintenance; (b) must be at least 0.75 acre in size to accommodate equipment; (c) must be accessible via improved roadways; (d) must be able to accommodate adequate line of sight (LOS) (e.g., not surrounded by tall trees or utility poles/wires) with minimal improvements; (e) must be able to accommodate utility, communication, and security infrastructure (e.g., power, landlines/fiber optics) with minimal improvements; (f) should not be in close proximity to populated areas to minimize safety concerns and disturbance.

## **2.2.2 Coordination with GRASI Landscape Initiative Partner Agencies**

After site/training requirements were identified, the Air Force met with state land owners and managers, including the Northwest Florida Water Management District (NFWFMD), Florida Department of Environmental Protection (FDEP), Florida Park Service, FFS, and the FWC. Through an iterative process consisting of several meetings and discussions with GRASI partners, the agencies identified particular state lands suitable for training areas and more than 70 potential emitter training sites, which met the minimum DoD requirements for training. GRASI partner sites that met the DoD training criteria included the BRSF and THSF. As part of the GLI planning process the Air Force also identified national forest lands that might also support military training needs. Initially, the USFS was not interested in becoming a GLI partner. In December 2014, the USFS indicated they would evaluate supporting some specific training needs, if the activities were compatible with ongoing forest management. In the future, partner organizations and locations would be considered if they are determined to be capable of supporting DoD's training needs. Use of any additional areas in the future would be subject to the appropriate level of additional NEPA analysis.

## **2.2.3 Evaluation of Locations**

### ***Proposed Action***

The 70 potential emitter training sites (shown in [Figure 2-1](#)) were evaluated by the Air Force on a site-specific basis to determine the "best fit" based on the previously discussed emitter requirements. Sites were ranked based on their compatibility with the requirements identified; and these 70 sites were narrowed down to the 12 sites identified and assessed in this EIS. The remaining sites were not carried forward as alternatives because they did not meet one or more of the requirements.

With regard to nonhazardous training sites, BRSF and THSF were the only potential sites identified by state agencies currently in a partnership agreement under GRASI with the Air Force that met the selection standards. Both locations meet all of the identified requirements, with the exception of THSF exceeding the 1.5-hour drive time from Eglin AFB/Hurlburt Field. However, the location is within the 1-hour flight time, so it has been carried forward as an alternative. Due to driving distance, THSF would be used infrequently for ground training. [Figure 2-2](#) shows a map of lands managed by



GRASI partners, as well as other state and federal lands that fall within 150 nautical miles of Eglin AFB and Hurlburt Field. As the map shows, the only GRASI partner lands of suitable size for training currently available to support DoD's training needs are located within THSF and BRSF. No other viable alternatives for auxiliary training sites were available that met the requirements identified previously; thus, no other alternatives were carried forward for consideration in this EIS.



**Figure 2-1. Potential Emitter Sites**



**Figure 2-2. Federal and State Lands Within 150-Nautical Mile Radius of Eglin AFB**

### ***Subalternative 1 (Preferred Alternative)***

Based on public and agency comment on the Draft EIS (provided in Appendix B) the Air Force developed a subalternative to the Proposed Action (i.e., Subalternative 1) that involves an additional proposed emitter site, specific locations for proposed landing zones/drop zones, and a reduced number of training activity types and levels in both forests—these are described in Section [2.3](#).

The additional emitter site was identified based on proximity to the proposed FWC locations identified under the Proposed Action; the FWC indicated upon review of the Draft EIS that the proposed FWC locations may have land use conflicts and identified an optional location near the previously proposed FWC sites that may minimize or eliminate the conflicts; this site (FWC-3) has been carried forward under Subalternative 1.

### **2.2.4 Alternatives Considered but Not Carried Forward for Full Analysis**

The Air Force initially considered a wide array of alternatives for supporting DoD training land and airspace needs. Alternatives that did not meet the selection standards or minimum criteria for meeting DoD mission requirements were not carried forward for analysis. These alternatives included the following:

- A) Reducing the amount of testing activity on military ranges to accommodate more training on existing DoD lands. Testing activities at the Eglin Range Complex and other DoD installations in the GRASI region are critical activities needed to determine combat effectiveness and capability of DoD systems and equipment. A reduction in testing could jeopardize the effectiveness of military weapons systems and equipment, as well as the safety and well-being of DoD

military members. This alternative was, therefore, not carried forward for consideration, as it would not allow the military to fully meet its training and testing needs.

- B) Establishing partnerships with federal landowners to support the GLI. A national agreement exists between the Department of Agriculture and DoD regarding general use of national forest land for military training. However, the USFS and the Air Force have not developed an agreement under the *GRASI Strategic Plan* to develop suitable training areas at this time. In 2013 and 2014, the Air Force contacted the USFS to determine the agency's interest in becoming a GLI partner. At that time, the USFS indicated that they are unwilling to be a GLI partner in either Conecuh or Apalachicola National Forest. While this may be an option for future training proposals, it is not within the timing and scope of the current proposal. The Air Force would have to review all of the training requirements and develop a proposal designed for national forest land in light of the legal requirements applicable under all federal laws to those lands. Then it would still need to work with the USFS to identify areas that might be suitable in terms of meeting appropriate selection standards tailored to all of those requirements. This process would require additional time and resources to develop a proposal that could be meaningfully evaluated. If and when the USFS and the Air Force are able to identify national forest lands that may be available for conducting nonhazardous training, such a proposal would be appropriately evaluated and considered, including a full evaluation of the potential environmental impacts.
- C) Purchasing additional dedicated DoD range lands. The purchase of new lands to support the Proposed Action does not meet the purpose and need for the GLI proposal. Under the GLI, the Air Force does not require a constantly available, fully dedicated, exclusive military use range. The nonhazardous training requirements do not justify such an acquisition, in part because there is no need for permanent construction. Since this training would be compatible with other land use activity, it can be conducted on the lands managed by state agencies that have developed agreements under GRASI with the Air Force.

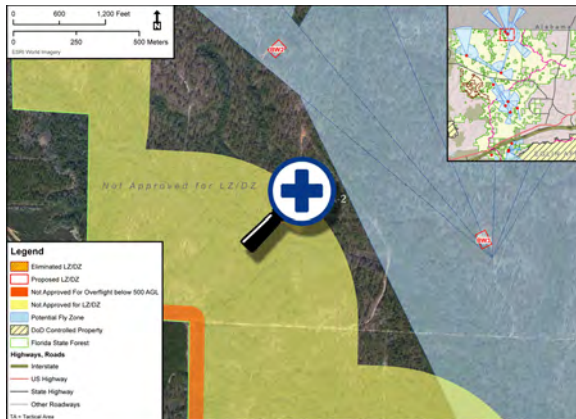
DoD and Air Force policy requires the Air Force to pursue a lesser interest in land rather than absolute ownership (fee simple title) when the requirement for the use of land would be limited in time or intermittent, as is the case with the Air Force's GLI proposal (DoDI 4165.71; AFI 32-9001). Prior to pursuing any purchase of land for training purposes, the Air Force would have to determine that the requirement cannot be satisfied by securing permission to use state or other lands through a long-term, nominal, or low-cost lease or to periodically use such lands under a license or permit.

In addition to being unnecessary, acquiring ownership of the property would be too expensive. The process to acquire and establish a new military training range is typically lengthy (five to seven years) and resource intensive. Additionally, any land areas purchased would require a significant amount of overhead funding for management, in terms of administration, security, and infrastructure development. To support nonhazardous training that is compatible with other land use, the purchase of land for a new, dedicated military range would not be an efficient use of resources, consistent with the *GRASI Strategic*

*Plan*, or cost-effective, particularly during a period of drastic federal budget reductions.

- D) Develop additional GRASI partnerships and conduct training outside of the 100- to 150-nautical mile geographic range established by the DoD training community. While there are certainly additional existing GRASI partner lands across the region that could be utilized to support training, if such lands are too remote, then too much training time would be lost in transit to access these areas. Time is a precious commodity for military trainers. The requirement to spend more than a few hours to get to and from a training area would limit the overall utility of the training location and would not support the DoD training objectives to provide trained and ready forces. Too much training time would be lost transporting units and equipment to the training site. Additionally, the further sites are from a unit's primary basing location, the higher the day-to-day operational costs to train and provide logistical support. As was stated in Chapter 1, additional GRASI partnerships will be pursued. If additional partnerships are established that meet the purpose and need in light of DoD selection standards to implement training, then alternatives for GRASI may be developed and evaluated. At this time, no other GRASI partner organizations have entered into an agreement with DoD to identify suitable training areas on lands managed by such organizations.
- E) The training capacity of each state forest individually, and in fact, both state forests together still does not fully meet the training requirements identified as part of the GRASI planning process. Therefore, while the operating flexibility of having both forests helps reduce scheduling issues and provides more flexibility for conducting ground training, it still does not completely resolve the anticipated future capacity issues identified by the GRASI airspace model. Therefore, utilization of each forest as its own alternative was considered but not carried forward, because one forest alone would not support the purpose and need of the Proposed Action.
- F) Under Subalternative 1, the Air Force utilized the processes described later in Section [2.5](#) (i.e., the "aeromapping" and constraint mapping process) to identify the proposed Subalternative 1 LZs/DZs. The Air Force first identified potential LZ/DZ locations as described previously, and then used the constraint mapping process to determine if proposed locations were suitable for LZs/DZs according to the constraints identified in [Table 2-21](#) and [Table 2-22](#), while the aeromapping process was used to identify potential approach/departure and fly zones around proposed LZs/DZs to avoid potential noise impacts to the public. The potential fly zones are provided in each LZ/DZ map in Section [2.3](#). Examples of the constraint mapping process are provided in [Figure 2-3](#) and [Figure 2-4](#) for LZ/DZ BW1 and LZ/DZ TH2, respectively, which show that the potential LZs/DZs are located in a noise buffer area identified as a result of analysis in this EIS. Consequently, these locations were not carried forward for use as potential LZs/DZs under Subalternative 1. This is the process that the Air Force would use to identify potential LZs/DZs under the Proposed Action; a potential location (such as a wildlife opening) may be identified by the Air Force and then the Air Force would apply the constraint mapping process to determine if there are any restrictions associated with the location (i.e., within a "Not Approved for LZ/DZ

Use” or “Restricted for Ground Operations Buffer.” If the proposed location does not have any constraints as identified in [Table 2-21](#) or [Table 2-22](#), the Air Force would then use the “aeromapping” process to determine potential fly zones, and then these LZs/DZs would be proposed to the FFS for use. The FFS would make the final determination as to whether the Air Force can utilize the LZ/DZ and what additional considerations may apply (e.g., seasonal use restrictions, etc.).



**Figure 2-3. BRSF – Eliminated LZ/DZ (BW1)**



**Figure 2-4. THSF – Eliminated LZ/DZ (TH3)**

## 2.3 PROPOSED ACTION AND SUBALTERNATIVE 1 (PREFERRED ALTERNATIVE)

The following describes the activities associated with both the Proposed Action and Subalternative 1. Because Subalternative 1 consists of the same activities under the Proposed Action, only at a reduced scale, both the Proposed Action and Subalternative 1 are described within the same sections, with the differences between the two highlighted for easy comparison.

Based on input during the public and agency review process for the Draft EIS in summer of 2014, the following changes were made to the Proposed Action training activities:

1. The Fixed-Wing Aircraft Landing Sites (FWALS) activity has been removed; no roadways would be used for fixed-wing landings in either forest. Only Blackwater Airfield in BRSF would be used for fixed-wing landings.
2. Light Aviation Proficiency Training (LAPT) has been removed. This action involved using the FWALS; LAPT was removed because FWALS were removed from the Proposed Action.
3. Forward Air Refueling Point/Hot Gas Operations (FARP/HGO) has been removed, associated with the removal of FWALS and LAPT.
4. Cross-Country Vehicle Movement (CCVM) has been changed to “Roadway Vehicle Use” (RVU) to better reflect the actual activity. All vehicles would use established roadways and trails; there would be no “off-road” vehicle use under the Proposed Action.



5. Vehicle Stream and Wetland Crossing (VSWC) has been included as part of RVU instead of a separate action. All crossings are on established roadways and trails. Impacts associated with using vehicle wetland crossings are still addressed.
6. Use of concertina wire as part of the Emplacement of Obstacles (EoO) activity has been removed from the Proposed Action.

At this time, no end-date is defined for whatever training use is ultimately approved by the FFS, the FWC, and State of Florida. Training activities would be projected to occur until such time as adequate range capacity became available on Eglin AFB to support the necessary training requirements. Ultimately, the FFS and FWC would specify the length of time that training activities would be permitted. The plans to support and manage these activities will need to be reviewed annually and approved, if they are determined to still be compatible with existing land uses.

### 2.3.1 Emitter Sites

Types of emitters would vary depending on need, and their use would be determined by constraints associated with the site and respective operational parameters of the specific system; as an example, use of high-powered systems with large safety hazard distances (SHDs) may be restricted at sites in close proximity to populated areas. Typical radar and telemetry units would consist of Kineto Tracking Mount (KTM) and Mobile Cinetheodolite Mount (MCM) systems. Typical training emitters used would include emitters such as the joint threat emitter (JTE).

Under both the Proposed Action and Subalternative 1, emitter training sites identified would utilize FFS and FWC lands via leasing agreements. These sites would accommodate mobile and temporary use; mobile use means that the site would be used for a day with operators on-site, while temporary use may last for several days. Proposed FWC sites would be used as mobile sites for day-use and/or frequent use and unauthorized access would be controlled by on-site Air Force personnel.

Temporary sites would be only those that are fenced. The FFS sites are either fenced or not fenced, and the Air Force would only place fences in these areas as permitted by the FFS. If fences are not approved, the sites would be used as mobile sites. The Air Force would coordinate with the FFS and FWC regarding approved use of emitter sites, which may result in new or additional locations in the future, such as roadsides or other open areas; use of roadsides may require road closure and additional NEPA-related



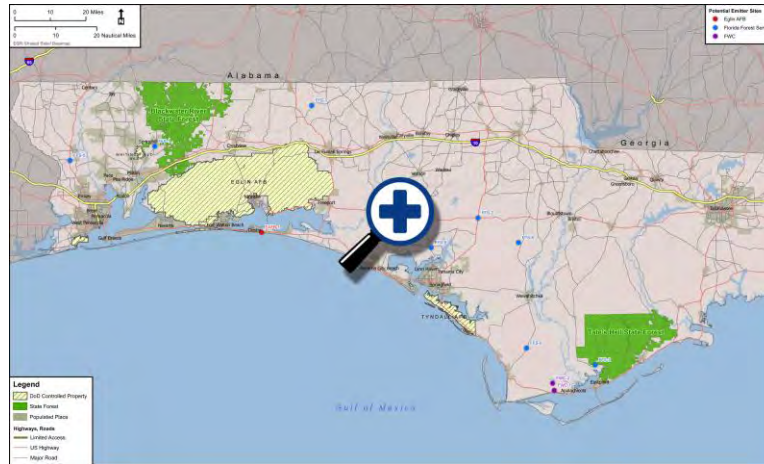
**Kineto Tracking Mount Emitter**



**Joint Threat Emitter**



analysis may be required. Proposed locations common to both the Proposed Action and Subalternative 1 are shown in [Figure 2-5](#) through [Figure 2-7](#). [Figure 2-8](#) provides the location of an emitter site associated with Subalternative 1 only; this site was identified by the Air Force as a proposed emitter site to replace sites FWC-1 and FWC-2 as a result of comments on the Draft EIS submitted by the FWC (see Appendix B). If the Subalternative is selected as a result of the Record of Decision, site FWC-3 would be used and sites FWC-1 and FWC-2 would not be used.



**Figure 2-5. Location Overview of Proposed Common Emitter Sites**



**Figure 2-6. Regional View (West) of Proposed Common Emitter Sites**



**Figure 2-7. Regional View (East) of Proposed Common Emitter Sites**



**Figure 2-8. Subalternative 1 Emitter Site (FWC-3)**

A component of both the Proposed Action and Subalternative 1 is to establish up to 12 radar, telemetry, and emitter training sites throughout northwest Florida to support development of a simulated IADS to be used for air training. Under this training scenario, aircrew would be operating in already-established military SUA, normally at high altitudes. Radar and telemetry emitters are used for tracking aircraft and navigation; training emitters are radar simulator systems designed to help train military personnel to identify and counter enemy missile or artillery threats from land or sea. The simulated IADS would utilize land, air, and sea space across the Florida panhandle, southern Alabama, and the waters of the Gulf of Mexico to provide a training venue that could be tailored to specific training scenarios. The Eglin Range simulated IADS would provide a well-designed, mutually supporting simulated training capable of providing balanced air defense coverage for detection and engagement across the northwest Florida airspace for all altitudes. One system would provide coverage for another where gaps in coverage are determined. The simulated IADS would provide a unique, viable, and robust training challenge for United States (U.S.) and coalition assets seeking to assess system and aircrew performance.

The majority of sites identified as part of the screening process are associated with FFS fire-spotting towers, while two sites are owned by FWC and one site by Eglin AFB. All sites are either “improved” or “semi-improved.”

Most can accommodate LOS requirements without improvements; however, at two sites (FFS-8, FFS-9) some minor tree clearing/topping (less than 0.5 acres) would improve LOS. Power generation at each site would be provided either by generator (e.g., industry-standard diesel generator enclosed in housing with vertical exhaust pipe) or connection to available utilities. Any improvements would need to be coordinated with the land owners and identified as part of the lease agreements.



**Typical Semi-improved Emitter Site**

Not all proposed sites may be used, and only several at any one time would be operational. [Table 2-1](#) summarizes the proposed emitter locations and their associated details. In the future, additional potential emitter sites may be proposed at sites required to enhance training in support of new and emerging training requirements. Potential new sites would be evaluated in the same fashion as those identified in Section [2.2](#) and would be subject to additional NEPA analyses.

**Table 2-1. Summary of Emitter Types and Proposed Locations**

Site Identifier	Description / Approximate Size*	Adequate LOS	Available Utilities	Security	Proximity of Residences
<b>Proposed Action and Subalternative 1</b>					
FWC-1	Semi-improved, cleared area – both sites adjacent to each other. (22 acres total)	360 degrees	Power; no water/fiber optics/telephone	Fencing required for temporary use.	N/A
FWC-2		270 degrees	Power w/in 0.5 mile; No water/fiber optics/telephone		N/A
EAFB-1	Henderson Beach location – owned and operated by Air Force.	360 degrees	Power; Water; Telephone; Fiber Optics	Security available.	Adjacent recreation area.
FFS-1	Coldwater Forestry Site (FS)– improved site with paved areas, buildings, and watch tower. (3 acres)	270 degrees	Power; Water; Telephone; No fiber optics		FFS Resident Staff
FFS-2	East Bay FS – improved site with paved areas, buildings, and watch tower. (16 acres)	270 degrees	Power; Water; Telephone; No fiber optics		FFS Resident Staff
FFS-3	Semi-improved area near Jackson Still FFS tower site. (1 acre)	180 degrees	Power; Water; Telephone; No fiber optics	Fencing required for temporary use.	Residence w/in 80 meters.
FFS-4	Semi-improved area near Moddy FFS tower site. (1 acre)	180 degrees	Power; Water; Telephone; No fiber optics		N/A
FFS-5	Molino FS – improved site with paved areas, buildings, and watch tower. (5 acres)	270 degrees	Power; Water; Telephone; Fiber Optics	Security available.	FFS Resident Staff
FFS-6	White City FS – improved site with paved areas, buildings, and watch tower. (11 acres)	180 degrees	Power; Water; Telephone; Fiber Optics		FFS Daily Staff
FFS-7	Youngstown FS – improved site with paved areas, buildings, and watch tower. (7 acres)	180 degrees	Power; Water; Telephone; Fiber Optics		Daily FFS and Sheriff Dpt. Staff.
FFS-8	Semi-improved area near Smith FFS tower site. (10 acres)	90 degrees	Power; Water; Telephone; No fiber optics	Fencing required for temporary use.	Residence w/in 51 meters.
FFS-9	Vicksburg FS – improved site with paved areas, buildings, and watch tower. (14 acres)	90 degrees	Power; Water; Telephone; No fiber optics	Security available.	FFS Resident Staff.
<b>Additional Site for Subalternative 1</b>					
FWC-3**	Forestry road near sites FWC-1 and FWC-2. (4 acres)	360 degrees	None	None – road is closed to the public	N/A

FFS = Florida Forest Service; FS = Forestry Site; FWC = Florida Fish and Wildlife Conservation Commission; LOS = line of sight; N/A = not applicable

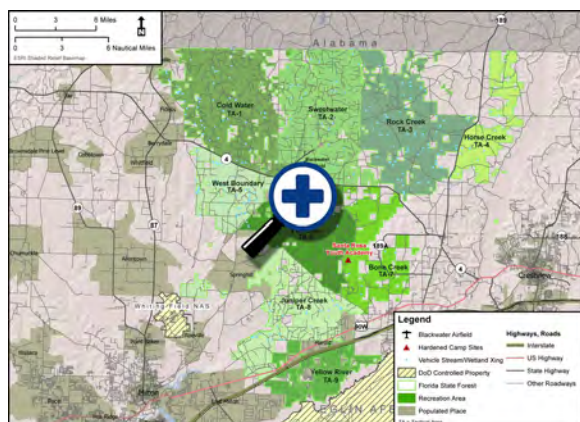
\*Rounded to the nearest acre; \*\* Under Subalternative 1 site FWC-3 would replace sites FWC-1 and FWC-2.

### 2.3.2 Training Activities in Northwest Florida State Forests

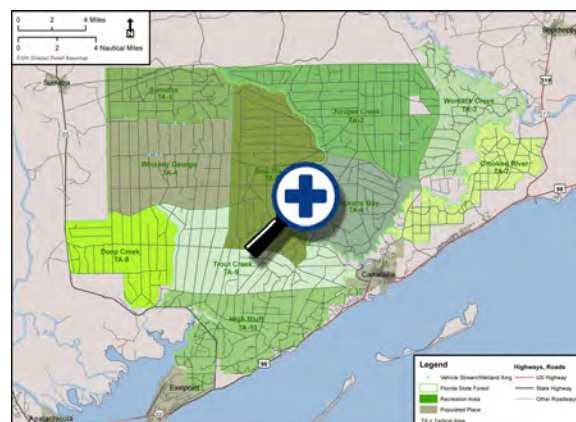
Training activities associated with the Proposed Action and Subalternative 1 consist of utilizing existing areas cleared by the FFS as part of regular forest management



activities for helicopter landing and drop zones, use of existing airfields for aircraft landings, and a number of different land and air training activities. These activities currently occur in the areas between designated test/training sites on the Eglin Range and are evaluated in detail in the *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c). The Air Force proposes to create flexibility by obtaining the necessary permits and leases to use public lands when current military training areas are not available for these activities. Specifically, suitable areas within two state forests in northwest Florida, BRSF and THSF, would be leased through agreements with FFS (Figure 1-2). For the purposes of this EIS, each state forest has been divided into “tactical areas” (TAs), which correlate to each state forest recreational area as shown in Figure 2-9 and Figure 2-10. While the FFS further segments each recreational area into smaller management units, this EIS uses the TA level to provide a cohesive, holistic overview of training and associated impacts. This information can be used for TA and management unit scheduling, as well as future planning and tiering as training locations change over time. Under the Proposed Action, training activities may occur in any of the TAs, whereas specific locations for training have been identified under Subalternative 1. Under both scenarios, training activities would be conducted subject to restrictions identified via coordination with the FFS during the planning process, as well as any constraints or mitigations identified in this EIS.



**Figure 2-9. BRSF Tactical Areas**



**Figure 2-10. THSF Tactical Areas**

Training in the TAs would provide flexibility for those training units that are unable to schedule time on the Eglin Range or in the RA due to other higher-priority activities or range congestion. As anticipated growth in military missions continues, training in the TAs could occur at frequencies described in Table 2-2 through Table 2-19. All training activities in the state forests would be conducted per the requirements of Eglin AFB Instruction (EAFBI) 13-212, *Range Planning and Operations*, Chapter 7 – Environmental Management (December 2010, Interim Change on 9 September 2011), as applicable, and in accordance with the respective state forest management plans. EAFBI 13-212, Chapter 7 (<http://grasieis.leidoseemg.com/documentation.aspx>).

EAFBI 13-212, Chapter 7 identifies requirements for protection of natural and cultural resources and waste management. Additionally, training activities would implement, as appropriate, the terms and conditions identified in the following documents (also available at the above website):

- Eglin AFB Interstitial Range Area Biological Assessment (U.S. Air Force, 2012)
- USFWS Interstitial Range Area Biological Opinion (USFWS, 2012)

- Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion (USFWS, 2013)
- *Eglin AFB Riverine/Estuarine Programmatic Environmental Assessment* (U.S. Air Force, 2004)
- Eglin AFB Riverine/Estuarine Biological Assessment (U.S. Air Force, 2004)

As part of the Proposed Action, Eglin AFB would establish a Landscape Implementation Team (L.I.T.) and a GLI Liaison to coordinate with the FFS in the following capacities:

- Developing real property leases/agreements
- Determining the need for the state forest training outlet due to of lack of capacity on the Eglin Range through current Eglin Range scheduling processes and developing and implementing a methodology for scheduling training activities on the state forests
- Identifying and implementing funding/reimbursement mechanisms to pay for leases/agreements
- Identifying specific operating requirements (e.g., number and sizes of LZs/drop zones [DZs] needed for a particular year)
- Updating and revising training directives and safety procedures to make them applicable to each GLI training site to provide the same level of protections for these resources and their users as if these sites were subject to Eglin Range Complex requirements
- Developing addendums/attachments to EAFBI 13-212 Chapter 7 for BRSF and THSF to identify environmental considerations detailed in this EIS
- Ensuring compliance with EAFBI 13-212 Chapter 7, and appropriate environmental requirements

All mitigations identified in the final Mitigation Plan would be incorporated into an operating agreement with the FFS. The Mitigation Plan will be developed by the Air Force utilizing a collaborative team of subject matter experts after a decision has been made with regards to implementation of the GLI; the Mitigation Plan must be completed within 90 days of decision and approved by Headquarters Air Force. The plan will be available to the public by request.

For all training activities, operators must adhere to respective state forest management plan requirements. Such requirements include contacting the respective forest dispatch to identify locations of forest recreational activities for avoidance of recreational users. Other than the hardened camp sites (described later in this chapter), which would be leased to the Air Force for exclusive use, no area closures are proposed. Outside of the hardened camp sites and Blackwater Airfield, training would mainly occur in small forest management units in order to minimize interference with other users, and personnel would avoid contact with the public to the extent possible. However, should there be an encounter, military personnel would identify themselves and then suspend training activities and move away from the area, yielding to the public user. On roadways and vehicle trails, military personnel would yield to the public. In addition, no substantive land disturbance (e.g., land clearing, construction, digging of pits) would be allowed, and personnel must collect all waste/used expendables. These requirements are further detailed in Chapter [3](#) under the associated resource sections.



The main groups conducting training in the two state forests consist of multiple units organized under the AFSOC located at Hurlburt Field and the 7 SFG(A) located at Eglin AFB. Other groups may also utilize the BRSF and THSF intermittently as needed. However, regardless of which groups use these areas for training, the activities, restrictions on use, and associated expendables would be the same.

Training activities described under the Proposed Action and Subalternative 1 are not mutually exclusive, and some training activities would occur in support of other activities or subsequent to other training activities. An example would be a training mission involving several helicopters flying from Eglin AFB to a BRSF tactical area LZ/DZ where personnel and equipment would be dropped via an Airdrop (AD) or a low-level insertion/extraction. Personnel may then conduct cross-country dismounted movement training to the Short-Term Offender Program (STOP) Camp or another LZ, while along the way bivouacking, conducting communications and surveillance operations, and utilizing expendables. Once reaching their objective they would be extracted either via another low-level insertion/extraction or cross-country vehicle movement. Aircraft would use existing MOAs and controlled airspace, as is currently done, to maneuver between Eglin AFB and the state forests.

As discussed in Sections [1.3](#) and [1.4](#), the goal of the GLI is to increase the military flexibility of the region. The intent for implementing GLI training would be to start slowly and increase nonhazardous training utilization of THSF or BRSF to acceptable levels that are compatible with and can be supported by the FFS. Training would only be implemented to the extent that DoD units need the additional off-base training capacity to support nonhazardous activities. It is important to remember that new lands would not support full training utilization like dedicated military training ranges at Eglin AFB. Because of safety limitations and existing policy, activities using live fire and duded munitions would not be conducted in proposed GLI training areas. On Eglin AFB, testing occurs 365 days per year, while training is conducted during 232 days per year, accounting for holidays, weekends, etc. Due to use limitations and increased travel times required to access BRSF and THSF, total use of THSF or BRSF is anticipated to be well below the utilization rates of dedicated military ranges. Training utilization rates would be further reduced during hunting seasons and other times when military use would not be compatible with existing land uses, or as determined by the FFS.

While training utilization projections would be well below 232 days per year, it is difficult to predict just how frequently units would utilize GLI locations to support their training requirements. Given this uncertainty, this EIS Proposed Action analysis evaluates impacts based on a “maximum-use scenario” that has been developed for each training activity. Evaluation of this scenario ensures that impact characterizations are conservative and do not underrepresent potential impacts should there be an occasion where maximum potential use would occur. Additionally, each maximum-use scenario is applied and analyzed for each forest in the event that one forest is unavailable for a certain type of training due to scheduling issues or other factors; this ensures that each forest is similarly treated in terms of potential impact. These maximum-use scenarios are detailed in tables accompanying each activity description and are based on existing Eglin AFB usage within the Eglin Range.

With the exception of flights entering existing SUA at operations tempo and patterns previously established (e.g., MOA, military training routes [MTRs]), aircraft en route to or from the proposed state forest training areas would fly through areas located between their home base and the state forest. In most cases, training missions at proposed

training sites would originate from Eglin AFB. There will not be an increase in flights over Gulf Islands National Seashore, which is located 111 miles west of BRSF and 231 miles west of THSF.

For Subalternative 1 a “reduced-scale scenario” is evaluated that identifies specific locations for training, as well as a number of activities and associated frequency and duration that are reduced from the “maximum-use” scenario addressed under the Proposed Action. As an example, under Subalternative 1 no expendable use would occur anywhere in either forest with the exception of the hardened camp sites at BRSF. These Subalternative 1 details are highlighted in conjunction with descriptions of the Proposed Action. Under either scenario, numbers of personnel used during training activities typically range from 10 to 50 and may involve any number and type of vehicles. Personnel would travel to BRSF either by road or aircraft as part of training. Because of distance (150 to 200 miles depending on route taken), road travel to THSF would be infrequent, and most training activities would be associated with air transport of personnel and equipment to THSF tactical areas.

The goal of the analyses in the EIS is to identify potential impact areas and identify constraints associated with their use as related to the training activities described in this chapter. The analyses identify (1) potential impacts associated with training activities, (2) areas that should be avoided for certain activities, and (3) any mitigations or management requirements needed to minimize adverse impacts. The user constraints and mitigations would be used for planning and scheduling purposes by the L.I.T. in coordination with the FFS. Avoidance and mitigation requirements would be communicated to the users prior to implementation of the activity.

The proposed training activities would be carried out by units of AFSOC, units of 7 SFG, F-35 Joint Strike Fighter and support units, and other DoD units. Training activities evaluated in the EIS would be carried out as part of either small unit training events or larger regional training exercises, such as AFSOC’s Emerald Warrior training exercise, exercises when the Eglin Range capacity or capability does not exist. AFSOC and other joint service units may elect to conduct compatible components of these training actions on THSF or BRSF as part of the GLI Proposed Action. Aircraft would use the existing Eglin AFB and Tyndall AFB MOAs and the Gulf of Mexico Warning Areas to fly from Eglin AFB to the forests. No change in the frequency or duration of flight activities over the Gulf Islands National Seashore is anticipated.

### 2.3.2.1 Landing Zones/Drop Zones



**Typical LZ/DZ**

Under both the Proposed Action and Subalternative 1, existing cleared areas within the state forests would be utilized as landing sites for helicopters and DZs for personnel and equipment from various aircraft (either fixed or rotary wing). Landing and drop activities would occur as part of the training activities discussed later in this chapter. LZs are cleared areas that vary in size depending on the number and type of aircraft being used; a single CV-22 (Osprey) would need about an acre, while two CH-47s would need about 2.75 acres.

DZs can be as small as a semicleared 0.3-acre opening or much larger, depending on the quantities/sizes of personnel and equipment being dropped. Both LZs and DZs must be free of commonly used infrastructure (e.g., telephone poles, electrical lines). Several sites located throughout the state forests may be established and utilized at any one time. It is important to note that these sites would be open areas that have already been cleared of tall vegetation by the FFS through regular forest management activities; no additional land clearing would be necessary for the purpose of the GLI Proposed Action and no land development or other improvements would be required by the Air Force. For the most part, LZ/DZ locations may change over time based on open area availability and training needs and would likely change from year to year through coordination and planning with the FFS. In contrast, six “permanent” LZs/DZs would be established: Blackwater Airfield and two near the hardened camp sites at BRSF, and three sites at THSF, which are already established FFS helo-pads. These particular LZs/DZs would, similarly, not require any additional land clearing or improvements. Under both the Proposed Action and Subalternative 1, Blackwater Airfield in BRSF would be used for fixed-wing and helicopter landings; Blackwater Airfield is already an established landing site for fixed-wing aircraft, and may occasionally be used for helicopter landings depending on the training requirement/activity.

Under Subalternative 1, 16 initial LZ/DZ locations (including Blackwater Airfield) have been identified for potential use; 13 at BRSF and 3 at THSF. Under the Proposed Action and Subalternative 1, up to eight LZs/DZs (including the hardened camp site locations and Blackwater Airfield) may be active at one time, distributed between the forests. [Table 2-2](#) lists details of LZ/DZ activities and the location of Subalternative 1 LZs/DZs. [Figure 2-11](#) shows the location of the Blackwater Airfield, and [Figure 2-12](#) through [Figure 2-21](#) show the proposed locations of the remaining Subalternative 1 LZs/DZs at both BRSF and THSF.

As discussed in Section [2.2.4](#), the Air Force utilized the processes described later in Section [2.5](#) (i.e., the “aeromapping” and constraint mapping process) to identify the proposed Subalternative 1 LZs/DZs, while eliminating two potential LZs/DZs based on this process.

**Table 2-2. LZ/DZ Details**

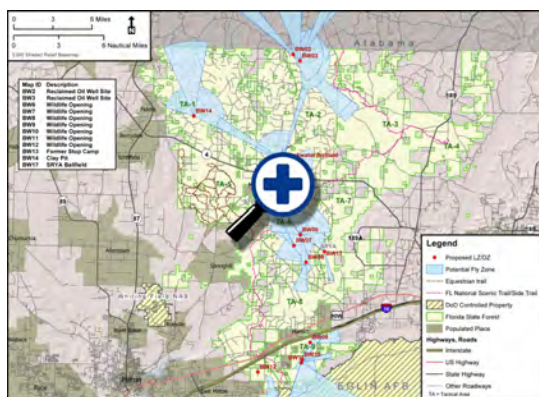
Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
None <sup>1</sup>	Varies depending on size and location of LZ/DZ as well as associated training activity (see subsequent sections).				Only utilize locations previously cleared by the FFS as part of regular forest activities. No land disturbance in wetlands or floodplains; no new impervious surfaces.
Subalternative 1 Locations					
LZ/DZ Identifier	Location / Description				Approximate Size (rounded to nearest acre)
Blackwater Airfield	A FFS-managed airfield to which the FFS permits public access on a “request” basis, should its condition be judged safe and not otherwise in use. The Air Force would also request to use the airfield in a similar manner.				25
BW2	Reclaimed Oil Well Site				1
BW3	Reclaimed Oil Well Site				1
BW6	Wildlife Opening				7
BW7	Wildlife Opening				6

**Table 2-2. LZ/DZ Details, Cont'd**

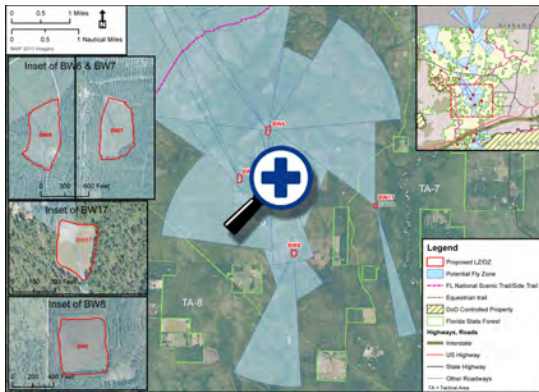
Subalternative 1 Locations (Cont'd)		
LZ/DZ Identifier	Location / Description	Approximate Size (rounded to nearest acre)
BW8	Wildlife Opening	6
BW9	Wildlife Opening	7
BW10	Wildlife Opening	7
BW11	Wildlife Opening	3
BW12	Wildlife Opening	57
BW13	STOP Camp	3
BW14	Clay Pit	11
BW17	SRYA Ball Field	2
TH2	Existing FFS helo-pad	2
TH4	Existing FFS helo-pad	1
TH6	Existing FFS helo-pad	0.5

LZ = landing zone; DZ = drop zone; FFS = Florida Forest Service; SRYA = Santa Rosa Youth Academy; STOP = Short-Term Offender Program

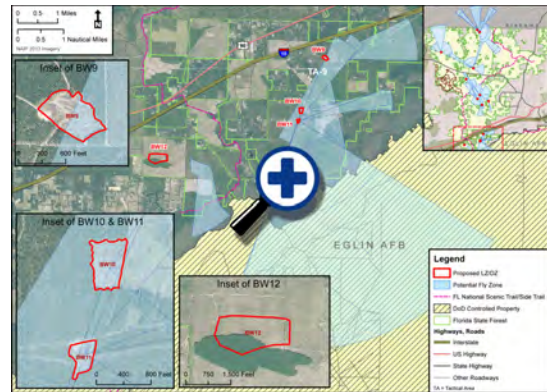
1. Establishment, operations, and maintenance as part of regular FFS activities; the Air Force would not conduct land-disturbing activities.

**Figure 2-11. BRSF Blackwater Airfield****Figure 2-12. BRSF Overall LZs/DZs****Figure 2-13. BRSF - LZ/DZ BW2 and BW3**





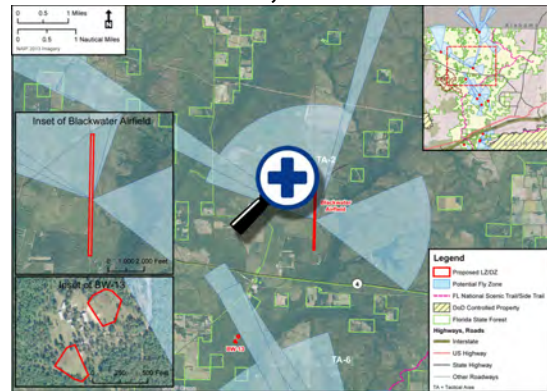
**Figure 2-14. BRSF – LZs/DZs BW6, BW7, BW8, BW17**



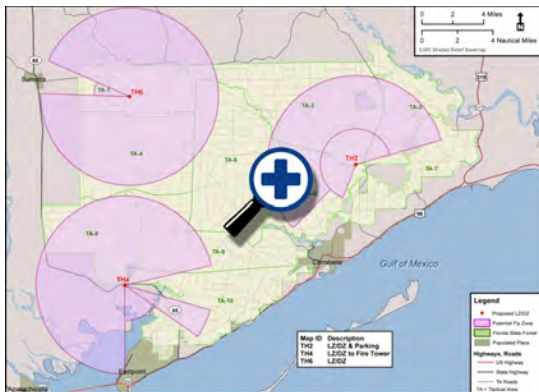
**Figure 2-15. BRSF – LZs/DZs BW9, BW10, BW11, BW12**



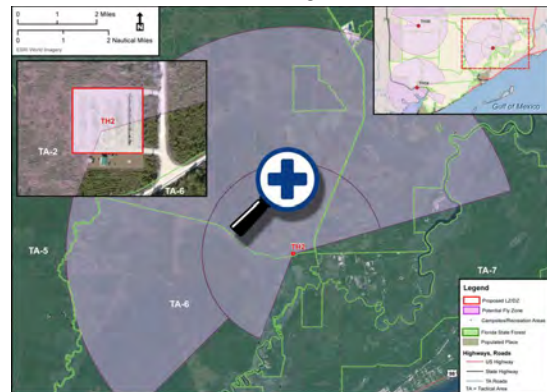
**Figure 2-16. BRSF – LZ/DZ BW14**



**Figure 2-17. BRSF – BW Airfield, LZ/DZ BW13**



**Figure 2-18. THSF Overall LZs/DZs**



**Figure 2-19. THSF – LZ/DZ TH2**



**Figure 2-20. THSF – LZ/DZ TH4**



**Figure 2-21. THSF – LZ/DZ TH6**



### 2.3.2.2 Use of Expendables

Use of Expendables (UoEX) involves use of various training munitions and pyrotechnics during training activities. Under the Proposed Action noise-generating expendables (e.g., blanks) at BRSF would only be used at hardened camp site locations (discussed in Section [2.3.2.17](#)). Simulated munitions (consisting of plastic pellets or paintballs, which produce little or no noise) and smoke grenades may be used during training activities described in this chapter in approved areas as discussed in Section [2.5](#). At THSF, use of noise-generating expendables could be used in approved areas as identified in Section [2.5](#). Under Subalternative 1 no expendables would be used outside hardened camp sites at BRSF, and there would be no expendable use at THSF.

Exact quantities of expendables per training activity are unavailable. However, the average annual total quantity of expendables used on the Eglin Range in interstitial areas was identified in the *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c). That quantity was used as an estimated annual average number of expendables potentially used under the Proposed Action and Subalternative 1. This would conform to the maximum-use scenario as discussed previously; actual numbers of expendables would likely be considerably less, since the state forest areas would only be used as needed.

Using the Eglin Range interstitial area expendable amounts, an estimate of expendables has been determined for a single training event based on the number of training events utilizing expendables and associated potential frequency of occurrence; however, expendables may not be used during every event. The overall total number of expendables, regardless of how many events occur in a year, would not exceed the estimated annual quantity. [Table 2-3](#) lists details of UoEX activities for the Proposed Action and Subalternative 1.



**Smoke Grenade**



**Use of Blanks**

**Table 2-3. UoEX Details**

Proposed Action			
Expendable Type	Estimated Maximum Quantity Per Year	Estimated Average Per Event	Restrictions
5.56-millimeter blank	~576,000	~10,000	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Police brass/expendable waste, avoid public use areas when using blanks.
7.62-millimeter blank	~196,200	~8,000	
Ground burst simulators	~5,172	~2 to 5	
M-18 smoke grenades	~4,038	~2 to 5	
Paintballs/plastic pellets	~50,000	~5,000	
Flares	Emergency use only – not associated with training activities		At BRSF noise-generating expendable use only at hardened camp sites.
Subalternative 1			
5.56-millimeter blank	~600,000	~10,000	Activity consists of 60 total days per year, with frequency up to eight 5-day periods.
7.62-millimeter blank			
Ground burst simulators	~5,172	~2 to 5	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Police brass/expendable waste.
M-18 smoke grenades	~4,038	~2 to 5	
Paintballs/plastic pellets	~50,000	~5,000	
Flares	Emergency use only – not associated with training activities		Expendable use only at BRSF hardened camp sites. None at THSF.

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; THSF = Tate's Hell State Forest

### 2.3.2.3 Low-Level Helicopter Insertions/Extractions

Low-level Helicopter Insertions/Extractions (LLHI/E) involve flying helicopters near treetop level and above to an LZ/DZ and inserting or extracting personnel. Insertion/extraction of personnel is conducted via fast rope, rappel, ladder, hoist or other means.

Aircraft would fly at between just above the surface to 3,000 feet AGL. [Table 2-4](#) lists details of LLHI/E activities under the Proposed Action and Subalternative 1. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency of LLHI/E events, as shown in [Table 2-4](#).*



**LLHI/E Activity**

**Table 2-4. LLHI/E Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to 4 total aircraft, combination of UH-60, CH-47, MH-47  There would be no more than 2 CV-22s used per event.	Up to 50 inserted/extracted	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	4–6 hours  Day and night	2 times/month (spread out among LZs/DZs)	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoidance of established recreational sites.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	3–5 days at a time (spread out among 5 LZs/DZs)  2 times/year	Same

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; LZ = landing zone; mm = millimeter; THSF = Tate's Hell State Forest

En route to LZs/DZs, helicopters would fly at 100 to 500 AGL (depending on noise constraint buffers identified in [Table 2-22](#)) and 110 to 120 knots indicated airspeed (KIAS). Each helicopter would spend between 30 minutes and 2 hours conducting training activities before returning to the base. About 50 percent of the aircraft's time is spent flying patterns: 40 percent of that time consists of circling or other pattern work within an approximately 1-mile radius of the LZ; 10 percent of the time is spent running upwind/downwind patterns or other pattern work within a 2-mile radius of the LZ.

The remaining 50 percent of the aircraft's time is spent at the LZ. About 80 percent of this time, the aircraft hovers (stationary) at different altitudes depending on the training activity for personnel: 75 feet AGL for practicing hover or rappel activities from the aircraft, between 45 and 35 feet AGL for fast ropes, and at 15 feet AGL for rope ladders. The remaining 20 percent of time at the LZ, the aircraft is stationary on the ground with engines running and rotors turning.

Night operations make up about 50 percent of total sorties, with approximately 20 percent occurring after 10:00 PM. There is typically no flying on weekends or holidays.

#### 2.3.2.4 Temporary Combat Support Areas

Under both the Proposed Action and Subalternative 1, Temporary Combat Support Areas (TCSAs) involve set-up of logistical and medical tents and equipment around LZs/DZs and Blackwater Airfield in support of training activities. Activities include loading and unloading of supplies, set up of tents and other equipment, and providing logistics support and medical treatment of simulated casualties. This may also include use of temporary defensive positions (e.g., sandbag bunkers); digging of



**TCSA Activity**

foxholes or latrines would not occur. [Table 2-5](#) lists details of TCSA activities for the Proposed Action and Subalternative 1. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency of TCSA events, as shown in [Table 2-5](#).*

**Table 2-5. TCSA Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
May arrive at location via various aircraft or land vehicles	Up to 50	Paintballs/plastic pellets, M-18 smoke grenades, tents, generators  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day and night	Tied to frequency of other LZ/DZ activities.	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoidance of established recreational sites.
Subalternative 1					
Same	Same	<b>None (except at BRSF hardened camp site LZ/DZs)</b>	Same	<b>2 times/year</b>	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; GBS = ground burst simulator; FFS = Florida Forest Service; mm = millimeter; THSF = Tate's Hell State Forest

### 2.3.2.5 Airdrops

Airdrops (ADs) involve the insertion and/or resupply of personnel via release of troops or equipment over land-based DZs or over water. This activity would be in support of training activities. Aircraft would fly at 1,250 feet AGL for static line drops and up to



**Static Line Personnel Drop**



**Airdrop Bundle**

25,000 feet AGL for free fall drops depending on personnel and equipment type/requirements. [Table 2-6](#) lists details of AD activities for both the Proposed Action and Subalternative 1. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables and frequency/location of airdrop events as shown in [Table 2-6](#).* During an AD, the aircraft typically makes first contact at the DZ, flying between 500 to 1,000 feet AGL, conducts the drop, and then moves to orbit at 5,000 feet AGL, typically offset from the DZ by about 5 to 10 miles with run-in typically at 130 KIAS. [Table 2-7](#) summarizes the minimum DZ size for type of AD.

**Table 2-6. Airdrop Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to four total aircraft, combination of UH-60, CH-47, C-130, C-17, C-145; CV-22  There would be no more than 2 CV-22s used per event.	Up to 72 depending on associated training activity and aircraft.	Land drops: approximately 15 cubic foot container of water (~300 pounds); containerized delivery system (~500 pounds); paintballs/plastic pellets, M-18 smoke grenades  Water drops: 2 Zodiacs	24 hours  Day and night	4 times/day 232 days/year (spread out among LZs/DZs)  C-17 used 2-3 times/year	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoid established recreational sites and public boaters. No power motors in Bear Lake (BRSF). Avoidance of noise impacts to private landowners and established recreational sites during approach and departure.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	Static Line Personnel Drops and HALO: Quarterly  Equipment/CDS drops: BW6 & BW7 only 10 days/month up to 40 days/year	Same  Static Line Personnel Drops restricted to LZ/DZ BW12

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; LZ = landing zone

**Table 2-7. Minimum DZ Size for Airdrop Type**

Airdrop	Type	Width	Length
Personnel airdrop	Static line (low)	600 yards	600 yards
		This is for one jumper. Add 75 yards to the trailing edge depending on number of jumpers leaving the airplane.	
	Military free fall (high)	Determined by jumpmaster based on team proficiency. Could be as small as a 50-yard radius circle (tactical DZ).	
Simulated airdrop training bundle (sandbag)	SATB (low)	As small as a 300-yard radius circle.	
	Free fall delivery (very low)	400 feet	400 feet
		The rule of thumb is minimum DZ for this type is equal to delivery altitude plus a 200-foot safety margin (200-foot AGL drop + 200-foot safety = 400 feet).	

AGL = above ground level; DZ = drop zone; SATB = simulated airdrop training bundle



### 2.3.2.6 Air/Land Vertical Lift

Air/Land Vertical Lift (A/LVL) involves the insertion and/or resupply of personnel and/or equipment via landing an aircraft directly into an LZ or on Blackwater Airfield. This activity would be in support of training activities. Aircraft would fly from the surface to approximately 3,000 feet AGL 90 percent of the time and up to 10,000 feet AGL the remaining 10 percent of the time based on training requirements. [Table 2-8](#) lists details of A/LVL activities, which are the same under both the Proposed Action and Subalternative 1. *The difference between Subalternative 1 and the Proposed Action is that under Subalternative 1 there would be a reduced use of expendables as shown in [Table 2-8](#).*



**A/LVL Activity**

**Table 2-8. A/LVL Details per Event**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/ Equipment	Duration	Frequency	Restrictions
Up to two total aircraft, combination of CV-22, UH-60, CH-47, C-130, C-145.	Up to 72 depending on associated training activity and aircraft.	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	4x/day 232 days/year (spread out among LZs/DZs at each forest)  Blackwater Airfield used up to 12 times/year	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoidance of noise impacts to private landowners and established recreational sites during approach and departure.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp site LZ/DZs)	Same	Same	Same

BRSF = Blackwater River State Forest; DZ = drop zone; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; LZ = landing zone; mm = millimeter; THSF = Tate's Hell State Forest

### 2.3.2.7 Cross-Country Dismounted Movements



**CCDM Activity**

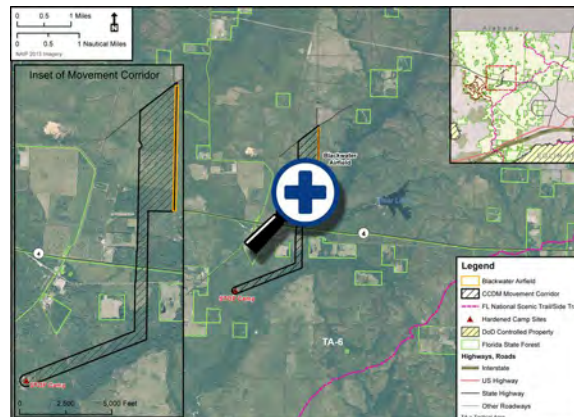
Cross-Country Dismounted Movements (CCDMs) involve the movement of operators (i.e., personnel) on foot across land areas from one location to another as part of simulated assault and reconnaissance training activities. CCDM may occur on or off roads or on unimproved trails. CCDM may also include crossing of streams and wetland areas. [Table 2-9](#) lists details of CCDM activities under the Proposed Action and Subalternative 1. *The difference between the Proposed Action and Subalternative 1 is that under the Proposed Action*

*CCDM may occur anywhere within the forest per the restrictions identified in Section 2.5, while under Subalternative 1 dismounted movements would only occur in a proposed movement corridor identified between Blackwater Airfield and a BRSF hardened camp site (STOP Camp), as shown in [Figure 2-22](#), and there is a reduced use of expendables. The movement corridor is approximately 476 acres in size.*

**Table 2-9. CCDM Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables /Equipment	Duration	Frequency	Restrictions
None	Up to 72 depending on associated training activity  Personnel would be in groups of 12	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	2 times/quarter	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoid established recreational sites.
Subalternative 1					
None	Same	<b>None (except at BRSF hardened camp sites).</b>	Same	Same	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest



**Figure 2-22. Subalternative 1 CCDM Corridor**

### 2.3.2.8 Roadway Vehicle Use



**RVU Activity**

Roadway Vehicle Use (RVU) involves the movement of personnel transport vehicles (ranging from high-mobility multipurpose wheeled vehicles [HMMWVs] to 2.5-ton trucks) and all-terrain vehicles (ATVs) across established roads from one location to another in support of resupply, logistics, and troop transport. RVU will utilize established roadways and associated easements, as well as vehicle water crossing points currently established and utilized by the FFS (identified in [Figure 2-9](#) and [Figure 2-10](#)). [Table 2-10](#) lists details of RVU activities under both the Proposed Action and Subalternative 1. *The difference between the Proposed Action and Subalternative 1 is that under Subalternative*

*1 there would be a reduced use of expendables.*

**Table 2-10. RVU Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, 2.5-ton trucks, motorcycles, minibikes, lightweight tactical ATVs	Up to 5/vehicle  Up to 10 vehicles	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	24 hours  Day or night	3 times/quarter	Vehicles are restricted to designated forest roads only. Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ).
Subalternative 1					
Same	Same	None (except at BRSF hardened camp sites)	Same	Same	Same

ATV = all-terrain vehicle; BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; RVU = Roadway Vehicle Use; THSF = Tate's Hell State Forest

### 2.3.2.9 Blackout Driving

Blackout Driving (BD) involves nighttime driving of ATV-type vehicles and HMMWVs without full headlights. Headlights would be diminished to "cat eyes," which are essentially small slits placed over the headlights; this provides enough light to utilize night vision goggles (NVGs) while driving. Roads used for this activity would be temporarily closed (likely in concert with EoO) to the public to prevent safety mishaps. [Table 2-11](#) lists details of BD activities for the Proposed Action. Under Subalternative 1 this activity would not occur. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

**Table 2-11. Blackout Driving Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Motorcycles, lightweight tactical ATVs (quad runners), HMMWVs	Up to 5/vehicle  Up to 10 vehicles	None	8 hours	3 times/quarter	Only on closed/designated roads.
Subalternative 1					
Would not occur					

ATV = all-terrain vehicle; HMMWV = high-mobility multipurpose wheeled vehicle

### 2.3.2.10 Emplacement of Obstacles

Emplacement of Obstacles (EoO) involves placement of items such as plastic or nylon fencing along unpaved roads and Hardened Camp Sites (discussed in Section [2.3.2.17](#)); no concertina wire or barbed wire would be used. The ground surface may be slightly disturbed (within 6 inches of ground surface) from placement of stakes and pickets. All stakes and/or pickets will be recovered at completion of the training exercise. [Table 2-12](#) provides details of EoO activities. Under Subalternative 1 this activity would not occur. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

**EoO Activity****Table 2-12. EoO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	N/A	Plastic/nylon fencing  Stakes/pickets	Length of associated training exercise  Day or night	10 times/year	Removal of all obstacles after exercise. Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ).
Subalternative 1					
Would not occur.					

EIS = Environmental Impact Statement; FFS = Florida Forest Service

### 2.3.2.11 Bivouacking/ Assembly Areas



**B/AA Activity**

Bivouacking/Assembly Areas (B/AA) involves the use of an area, mainly tented, where troops eat and rest overnight in support of training activities. There may be slight surface ground disturbance (within 6 inches of ground surface) from placement of tent stakes and pickets. All expendables/equipment would be recovered prior to leaving the site. [Table 2-13](#) lists details of B/AA activities. Under Subalternative 1 this activity would not occur. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

**Table 2-13. B/AA Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Three ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Tents and other supplies.  Stakes/pickets	Length of associated training exercise. Day or night	10 times/year	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ).
Subalternative 1					
Would not occur.					

ATV = all-terrain vehicle; EIS = Environmental Impact Statement; FFS = Florida Forest Service

### 2.3.2.12 Communications and Surveillance Operations

Communications and Surveillance Operations (C&SO) involve the use of sites to coordinate communications and/or conduct surveillance of “enemy forces” in support of training activities. The ground surface may be slightly disturbed from placement of tent stakes and pickets. This activity would occur under both the Proposed Action and Subalternative 1. [Table 2-14](#) lists details of C&SO activities, which are the same under both scenarios. *There is no difference between the Proposed Action and Subalternative 1 for this activity.*

**Table 2-14. C&SO Details per Event**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWVs, rental vehicles (trucks), ATVs and trailers to haul equipment	Up to 72 depending on associated mission activity.	Communication equipment, radio antennas, tents, radar equipment, camouflage nets, generators. The Air Force would use standard equipment; however, the goal when employing generators is to minimize noise and detection footprints. As such, the Air Force would use generators in the forests temporarily, only when necessary, and as approved by the FFS.	Length of associated training exercise  Day or night	Monthly	Avoid hunting season conflicts per the FFS (EIS Sections <a href="#">5.10/6.10</a> ). Avoidance of established recreational sites.

ATV = all-terrain vehicle; EIS = Environmental Impact Statement; FFS = Florida Forest Service; HMMWV = high-mobility multipurpose wheeled vehicle



### 2.3.2.13 Amphibious Operations

Amphibious operations involve boat operations on the water, loading/unloading of personnel to and from boats, and movement in streams, rivers, and lakes as part of egress/ingress operations. The types of boat motors used would be comparable to current civilian boat motors used on forest waterways. Amphibious activities would avoid those waterways used extensively for recreational purposes (e.g., Coldwater Creek) and would mostly utilize larger bodies of water given the size requirements for the amphibious watercraft. Should recreational users and military trainees be present on the same body of water, training activities would not impede canoers, kayakers, or tubers. [Table 2-15](#) lists details of amphibious operations activities. This activity would not occur under Subalternative 1. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*



**AO Activity**

**Table 2-15. AO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Up to six various inflatable and rigid powered watercraft per event; engines 35 to 200 hp. Watercraft may consist of Zodiacs and aluminum boats up to 28 feet with or without outboard motors.	Up to 6/watercraft	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	12 hours  Day and night	10 times/year	Avoid established recreational sites and public boaters. No power motors in Bear Lake (BRSF).
Subalternative 1					
Would not occur.					

BRSF = Blackwater River State Forest; hp = horsepower; mm = millimeter; THSF = Tate's Hell State Forest

### 2.3.2.14 Natural Resource Consumption

Natural Resource Consumption (NRC), similar to survival training, is the procurement of natural food sources such as small game and rodents, and eating of vegetation. Survival training is a critical component of military training and involves foraging and training personnel on critical survival skills (which includes teaching how to prepare traps and snares). It does not involve substantial consumption of natural resources and the likelihood of successful snaring or trapping is traditionally minimal. Locations of avoidance areas (e.g., sensitive habitat areas and species) would be communicated to participants prior to implementation of the activity. [Table 2-16](#) provides details of NRC activities. Under Subalternative 1 this activity would not occur. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 this activity would not occur.*

**Table 2-16. NRC Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
N/A	20 (10 teams at 2/team)	None	7 days Day and night	2 times/quarter	Avoid protected wildlife and plants.
Subalternative 1					
Would not occur.					

N/A = not applicable

### 2.3.2.15 Overwater Hoist Operations



#### OHO Activity

Overwater hoist operations (OHO) involves hoist rescue and recovery of personnel and watercraft over water. Aircraft would conduct operations from just above the surface of the water to a height of about 150 feet. Aircraft would hover about 10 feet over the surface for drops and about 80 feet above the surface for retrievals. [Table 2-17](#) lists details of OHO activities for both the Proposed Action and Subalternative 1. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 there would be no expendable use.*

**Table 2-17. OHO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Watercraft (see <a href="#">Table 2-15</a> )  Four total aircraft, combination of CV-22, HH-60, CH-47  There would be no more than 2 CV-22s used per event.	Up to 6/watercraft, including one safety swimmer, coxswain, medic, and assistant coxswain	Paintballs/plastic pellets, M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	4 to 6 hours  Day and night	1/month	No power motors in Bear Lake (BRSF). Avoid fishermen and boaters.
Subalternative 1					
Same	Same	None	Same	Same	Same

BRSF = Blackwater River State Forest; GBS = ground burst simulator; mm = millimeter; THSF = Tate's Hell State Forest

### 2.3.2.16 Opposing Forces Vehicle Operations

During opposing forces vehicle operations (OFVO), two teams (one "Red," the other "Blue") compete to locate each other on established roads in a simulated urban environment. Personnel may exit vehicles to conduct "search activities." Aircraft may be used as a "spotter" to direct one of the teams; the aircraft would fly at between 16,000 and 23,000 feet AGL. [Table 2-18](#) lists details of OFVO activities for the Proposed Action and Subalternative 1. *The difference between the Proposed Action and Subalternative 1 for this activity is that under Subalternative 1 there would be no expendable use except at BSRF hardened camp sites.*

**Table 2-18. OFVO Details per Event**

Proposed Action					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
HMMWV  Cessna 172 aircraft	Up to 5/vehicle  Up to 10 vehicles	M-18 smoke grenades  THSF only: 5.56-mm blanks, 7.62-mm blanks, GBSs	Day and night	5 times/week	Vehicles are restricted to forest roads, designated roads only. Avoid hunting season conflicts per the FFS (EIS Sections 5.10/6.10). Avoid established recreational sites.
Subalternative 1					
Same	Same	None (except at BRSF hardened camp sites)	Same	Same	Same

BRSF = Blackwater River State Forest; EIS = Environmental Impact Statement; FFS = Florida Forest Service; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter; THSF = Tate's Hell State Forest

### 2.3.2.17 Hardened Camp Site Use

**Figure 2-23. BRSF STOP Camp****Figure 2-24. BRSF SRYA Camp**

this section and Blackwater Airfield no other established recreational/camp sites are proposed for use.

Hardened Camp Site Use (HCSU) involves use of two hardened camp facilities located at BRSF ([Figure 2-23](#), [Figure 2-24](#)). Both camps were established by the Florida State Department of Juvenile Justice (DJJ); one is identified as the STOP Camp, the other is the Santa Rosa Youth Academy (SRYA). The STOP Camp was leased by the DJJ from FFS and returned after the program was shut down. The DJJ vacated its lease of the SRYA in the summer of 2013.

These sites consist of buildings (classrooms, administrative buildings, dormitories, dining facilities, and assembly areas) and infrastructure, such as utilities and roadways, and may be used as insertion/extraction points, LZs/DZs, command and control centers, training areas for combat in urban environment training, or other training activity support ([Table 2-19](#)).

These two sites would be leased from the FFS for exclusive use by the Air Force. With the exception of the two sites identified in

*The difference between the Proposed Action and Subalternative 1 is that under Subalternative 1 UoEX activity consists of 60 total days per year, with frequency up to eight 5-day periods.*

**Table 2-19. HCSU Details per Event (BRSF)**

Proposed Action / Subalternative 1					
Vehicles/Aircraft	# Personnel	Expendables/Equipment	Duration	Frequency	Restrictions
Aircraft: CV-22, HH-60, CH-47  There would be no more than 2 CV-22s used per event.  Vehicles: ATV-types HMMWVs	Up to 50	5.56-mm blanks, 7.62-mm blanks, GBSs, paintballs/plastic pellets, M-18 smoke grenades; simunitions	24 hours  Day and night	5 times/week 232 days/year	Upkeep and maintenance of facility.
Subalternative 1					
Same	Same	Same types of expendables. <b>Use: 60 total days per year, with frequency up to eight 5-day periods.</b>	Same	Same	Same

ATV = all-terrain vehicle; GBS = ground burst simulator; HMMWV = high-mobility multipurpose wheeled vehicle; mm = millimeter

### 2.3.3 Summary Comparison of Proposed Action and Subalternative 1 (Preferred Alternative) Details

The main differences between the Proposed Action and Subalternative 1, as described in Sections [2.2](#) and [2.3](#), are summarized in [Table 2-20](#):

**Table 2-20. Proposed Action and Subalternative 1 Detail Summary**

Action Component	Proposed Action	Subalternative 1
Emitter Sites	12 proposed sites	11 proposed sites
LZs/DZs	May potentially occur anywhere within BRSF/THSF subject to identified constraints in Section <a href="#">2.5</a> .	13 potential LZs/DZs identified at BRSF (including Blackwater Airfield).  3 potential LZs/DZs identified at THSF.
Use of Expendables	At BRSF use of noise generating expendables limited to hardened camp sites; other expendables approved anywhere subject to identified constraints in Section <a href="#">2.5</a> .  At THSF all expendables approved subject to constraints in Section <a href="#">2.5</a> .	At BRSF use of all expendables only approved at hardened camp sites; limited to 60 total days per year.  At THSF no expendables approved for use.
Low-Level Helicopter Insertions/Extractions	Overall, frequency is twice/month. At BRSF, expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	Overall, frequency is twice/year.  At BRSF expendable use only approved at hardened camp sites.  At THSF, no expendable use.

**Table 2-20. Proposed Action and Subalternative 1 Detail Summary, Cont'd**

Action Component	Proposed Action	Subalternative 1
Temporary Combat Support Areas	Overall frequency ties to other activities.  At BRSF, expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	Overall, frequency is twice/year.  At BRSF expendable use only approved at hardened camp sites.  At THSF, no expendable use.
Airdrops	Overall frequency is 4 times/day, 232days/year (spread out among LZs/DZs)  Expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> .	Static Line Personnel Drops and HALO: Quarterly  Equipment/CDS drops: BW6 & BW7 only 10 days/month up to 40 days/year  Static Line Personnel Drops restricted to LZ/DZ BW12  No expendable use anywhere except BRSF hardened camp sites.
Air/Land Vertical Lift	At BRSF expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	No expendable use anywhere except BRSF hardened camp sites.
Cross-Country Dismounted Movements	Movement may occur anywhere on either forest per constraints identified in Section <a href="#">2.5</a> .  At BRSF expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	At BRSF movement may only occur within the movement corridor identified in Section <a href="#">2.3.2.8</a> .  At BRSF expendable use limited to hardened camp sites.  At THSF no expendable use.
Roadway Vehicle Use	At BRSF expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	No expendable use anywhere except BRSF hardened camp sites.
Blackout Driving	Would occur per <a href="#">Table 2-11</a> .	Would not occur.
Emplacement of Obstacles	Would occur per <a href="#">Table 2-12</a> .	Would not occur.
Bivouacking/Assembly Areas	Would occur per <a href="#">Table 2-13</a> .	Would not occur.
Communications and Surveillance Operations	No difference – would occur per <a href="#">Table 2-14</a> .	
Amphibious Operations	Would occur per <a href="#">Table 2-15</a> .	Would not occur.
Natural Resource Consumption	Would occur <a href="#">Table 2-16</a> .	Would not occur.



**Table 2-20. Proposed Action and Subalternative 1 Detail Summary, Cont'd**

Action Component	Proposed Action	Subalternative 1
Overwater Hoist Operations	At BRSF expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> .  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	No expendable use at either forest.
Opposing Forces Vehicle Operations	At BRSF expendable use permitted anywhere per constraints identified in Section <a href="#">2.5</a> ; noise generating expendables only at hardened camp sites.  At THSF noise-generating expendables permitted per constraints identified in Section <a href="#">2.5</a> .	At BRSF expendable use limited to hardened camp sites.  At THSF no expendable use.
Hardened Camp Site Use	No difference; would occur per <a href="#">Table 2-19</a> .	

BRSF = Blackwater River State Forest; DZ = drop zone; LZ = landing zone; THSF = Tate's Hell State Forest

## 2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the training activities identified under the Proposed Action would continue to occur on Eglin AFB as described and assessed in the *Interstitial Area Range Final Environmental Assessment Revision 2* and *Eglin AFB Riverine/Estuarine Environmental Assessment*; BRSF and THSF would not be utilized, and no new emitter sites would be used. The No Action Alternative would not meet the purpose and need for the Proposed Action, in that there would be continued stress on the Eglin AFB user environment due to conflicts with hazardous and nonhazardous training activities. As use of the Eglin Range increases, these conflicts would become more frequent and problematic. Activities at BRSF, THSF, and the various proposed emitter sites would continue as described in the respective state forest management plans.

## 2.5 GENERAL OPERATIONAL CONSTRAINTS

In the context of this document, General Operational Constraints are actions inherent to the Proposed Action (and therefore not technically mitigations), and Proposed Resource-Specific Mitigations are those identified through impact analysis within this EIS to minimize potentially adverse impacts. Proposed Resource-Specific Mitigations are discussed in Section [2.7](#).

All training activities in the state forests would be conducted, as applicable, per the requirements of EAFBI 13-212 (Chapter 7, Environmental Management), in accordance with the respective state forest management plans and, as appropriate, the terms and conditions identified in the *GRASI Landscape Initiative Biological Assessment* (included in Appendix C), *Interstitial Area Range Final Environmental Assessment Revision 2*, the *Interstitial Area Biological Assessment*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the *Eglin AFB Riverine/Estuarine Biological Assessment*. Each of these documents is available for reference at <http://grasieis.leidoseemg.com/documentation.aspx>.

Documentation resulting from consultation with the Florida SHPO and the USFWS regarding this Proposed Action is provided in Appendix C, *Consultation Documentation*.

As discussed previously, all the activities under the Proposed Action currently occur on the Eglin Range, and have been evaluated under the documents mentioned previously. In order to ensure that all General Operational Constraints are identified and adhered to by training units, Eglin AFB's environmental management program has developed "Protection Levels" for areas on the Eglin Range that are utilized for ground training activities; these use levels are based on General Operational Constraints and are integral to environmental resource protection. Under the Proposed Action, the Air Force would utilize a similar system tailored for BRSF and THSF; use levels for the Proposed Action are described in [Table 2-21](#) and are applicable to all training locations within the boundaries of the state forests. Activity outside the boundaries of the state forests is limited to use of public roadways for transportation.

**Table 2-21. General Protection Levels for Proposed Action Ground Operations**

Protection Level	Restrictions	Area Covered
Prohibited	No access is permitted.	Camp/recreational sites, any cultural resource "prohibited areas," piping plover critical habitat (THSF)
Restricted	All activities must remain on roadbeds of established roads, including troop movements, vehicle operations, digging, and any type of ground surface disturbance. No refueling of vehicles or aircraft allowed.	Point locations for apiaries; sensitive species locations and associated FNAI sensitive habitats (pitcher plant bogs, rare plants, rare animals, invasive species); 200-foot buffer around Florida Natural Scenic Trail and equestrian trails; 1,500 feet around flatwoods salamander habitat; 330-foot buffer around bald eagle nests.
RCW Buffer	Follow <i>Management Guidelines for the Red-Cockaded Woodpecker on Army Installations</i> (U.S. Army, 2007) and <i>Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion</i> (U.S. Air Force, 2013), Table 4-2.	200-foot buffer around RCW cavity trees for ground operations
Wood Stork Habitat Buffer	Follow <i>Habitat Management Guidelines for the Wood Stork in the Southeast Region</i> (USFWS, 1990).	500-foot buffer around wood stork feeding/roosting habitat. Currently there are no GIS data for habitat at either forest. However, should habitat be identified these protections would be applied.
Limited Use-1 (LU-1)	<u>Approved Activities</u> : use of star cluster pyrotechnics (hand-held slap flares) only for emergency purposes; use of non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for paintballs only) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver and incidental and consumptive land disturbance. <u>Not Approved</u> : use of smokes, flares, or simulators; off-road vehicle use – all vehicles must remain on established roads; land development and point land disturbance outside of previously disturbed roadbeds and road shoulders. LZ/DZ use except on approved FFS sites not requiring additional land development – see Noise Protection Levels Map for further restrictions on LZ/DZ use. No refueling of vehicles or aircraft allowed.	100 feet around wetlands, water bodies and floodplains; areas exhibiting very limiting soil characteristics (e.g., susceptible to erosion) for LZ and/or bivouacking; cultural resource areas with inadequate surveys and/or "not cleared" areas; Tate's Hell Camp Gordon Johnson Historic District
Limited Use-2	<u>Approved Activities</u> : use of pyrotechnics (e.g., smoke grenades	All areas not covered by other

**Table 2–21. General Protection Levels for Proposed Action Ground Operations, Cont'd**

Protection Level	Restrictions	Area Covered
(LU-2)	and GBSs) and non-lethal small arms ammunition such as blanks and paintballs (at BRSF approved for smoke grenades and paintballs only, with GBSs permitted only at hardened camp sites) – see GLI Noise Protection Levels Map for further restrictions on noise-generating expendables. Dismounted maneuver. Incidental, point, and consumptive land disturbance (includes catholes) outside of previously disturbed roadbeds and road shoulders if approved by FFS. LZ/DZ use only on approved FFS sites with FFS coordination required for any additional land disturbance – see Noise Protection Levels Map for further restrictions on LZ/DZ use. Refueling of vehicles or aircraft allowed only on asphalt or concrete surfaces. <u>Not Approved:</u> off-road vehicle use – all vehicles must remain on established roads.	protection levels

BRSF = Blackwater River State Forest; DZ = drop zone; FFS = Florida Forest Service; FNAI = Florida Natural Areas Inventory; GBS = ground burst simulator; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; LU-1 = Limited Use-1; LU-2 = Limited Use-2; LZ = landing zone; RCW = red-cockaded woodpecker; THSF = Tate's Hell State Forest

As stated previously, General Operational Constraints are inherent to the Proposed Action, in that they are considered components of the Proposed Action's implementation. As an example, a 200-foot activity buffer around identified red-cockaded woodpecker (RCW) cavity trees is a requirement of EAFBI 13-212. Just as CCDM at BRSF and THSF is a component of the Proposed Action, so too is the requirement to maintain a 200-foot activity buffer around RCW trees at either BRSF or THSF since EAFBI 13-212 would be a component of the Proposed Action. Impact analysis in this EIS considers these requirements as part of the initial impact assessment. Thus, analysis of impacts to the RCW considers the implementation of the 200-foot activity buffer in the initial impact assessment; if potentially adverse impacts are identified, then Proposed Resource-Specific Mitigations were developed to minimize or avoid this potential.

Summarized below are the General Operational Constraints (GOCs) that would be implemented as part of the Proposed Action. These GOCs would be incorporated into the EAFBI 13-212 operational plan as a special section on the state forests and would be reviewed and updated as required on an annual basis to ensure ongoing compatibility.

### **General Operational Constraints**

All training activities are required to stay within the defined boundaries of the respective state forests. Ground activity outside the forest boundaries (e.g., adjacent land parcels, inholdings) is limited to transportation on public roadways.

Prior to implementation of the Proposed Action, the Air Force will:

- 1) Develop a Mitigation Plan identifying Proposed Resource-Specific Mitigations to be implemented, responsible parties for mitigation implementation and compliance evaluation, and monitoring mechanisms for evaluation of mitigation effectiveness.
- 2) Establish an L.I.T. composed of appropriate Eglin agencies and disciplines to coordinate with apposite Eglin agencies and the FFS. The L.I.T. will provide oversight to ensure the following requirements are implemented and the required

supporting processes are established for implementation prior to performing any missions identified in the GLI on identified state forest lands:

- a) Develop real property leases/agreements that incorporate the operational constraints and mitigations identified in this EIS.
  - b) Develop and implement a methodology for scheduling training activities, through existing Eglin organizations, which incorporates operational constraints and mitigations identified in this EIS and addresses any violations of the mitigation plan, including enforcement.
  - c) Develop and implement a methodology to identify specific training areas and corridors prior to ground operations to allow for any natural or cultural resource surveys and protection measures that may be necessary (i.e., RCW surveys).
  - d) Develop and implement a methodology, through coordination with appropriate Eglin agencies and disciplines and the FFS, for pre- and post-mission surveys of action areas to identify extent of environmental impact to training areas to correct any issues and adjust constraints and mitigations as necessary.
  - e) Identify and implement funding/reimbursement mechanisms to pay for leases/agreements and surveys (i.e., pre/post surveys for damage to sensitive species/habitats).
  - f) Identify specific operating requirements (e.g., number and sizes of LZs/DZs needed for a particular year).
  - g) Update and revise training directives and safety procedures to make them applicable to each GLI training site to provide the same level of protections for these resources and their users as if these sites were subject to Eglin Range Complex requirements.
  - h) Develop addendums/attachments to EAFBI 13-212 Chapter 7 for BRSF and THSF to identify environmental considerations detailed in this EIS.
  - i) Ensure compliance with EAFBI 13-212 Chapter 7 and appropriate environmental requirements by identifying the proper Eglin AFB organizations responsible for management of each constraint and mitigation, and ensuring the responsible organization has executed the intent of the applicable requirement.
  - j) Enter into mutual aid agreements with the closest fire departments to ensure adequate fire/emergency response.
- 3) Through various existing program offices and current practices Eglin AFB, with user group support, will:
- a) Develop forest-specific guidance on environmental restrictions and compliance requirements, to include mitigations and operational constraints identified in this EIS and associated consultations (i.e., environmental briefings, EAFBI 13-212 addendum).
  - b) Coordinate with the FFS and the FWC area biologists to identify compatible emitter and training site locations, as well as time and area constraints for training activities (e.g., avoidance of specific hunting seasons and associated areas, and previously scheduled recreational events in the forest, such as at Blackwater Airfield) and incorporate these constraints into unit training plans. At BRSF training in the Field Trial Area, Fox Hunt Area, Carr Unit, and Hutton Unit

would be limited to all training activities because of their size and the types/frequency of hunting activities that occur; training in these areas would be conducted according to FFS approval. The Florida Natural Scenic Trail (FNST) would be off-limits to training activities.

- c) Determine preferred locations for LZs/DZs, as well as preferred routings for use, by incorporating the noise constraints identified in [Table 2-22](#) into the “aeromapping” system (discussed in Section [3.3](#), *Noise*) to identify overflight constraint areas in support of avoiding adverse noise impacts to the public and sensitive species.
- d) Determine restrictions on noise-generating expendable use for proposed training activities by incorporating the noise constraints identified in [Table 2-22](#) into each operational training plan to identify noise constraint areas in support of avoiding adverse noise impacts to the public and sensitive species.
- e) Provide both a visual and written presentation of restrictions as presented in this EIS to unit commanders and training personnel. This can be accomplished through Eglin AFB Range Safety and Operations Procedures (RSOP) annual briefings, additional site-specific environmental briefings (i.e., BRSF and THSF), and/or through the Eglin AFB Center Scheduling Enterprise (CSE).
- f) Track briefings, inspections, restrictions, and reports for regulators in accordance with current Eglin procedures.
- g) Provide ground training units with global positioning system (GPS) coordinates for current RCW buffers.

**Table 2-22. Noise Protection Levels for Proposed Action Operations**

Protection Level	Restrictions	Area Covered
Not Approved for LZs/DZs	No LZs or DZs permitted.	2,200-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.
Avian Air Operations Buffer	No aircraft operations permitted.	500-foot buffer around RCW trees; 1,000-foot buffer around bald eagle nest trees.
Not Approved for Overflights below 500 feet AGL	No overflights below 500 feet AGL	TA-5 horse riding/field trial area; 200-foot buffer around camp sites/recreational sites, the Florida National Scenic Trail, and in/out parcels with residential structures.
Not Approved for Noise Generating Expendables	No noise generating expendable use allowed; includes blanks and GBSs.	4,000-foot buffer around camp sites/recreational sites and in/out parcels with residential structures.

AGL = above ground level; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone; RCW = red-cockaded woodpecker

- h) Document and resolve any issues related to environmental compliance with the FFS upon notice of any compliance issues.
- i) Establish a process for notification of locally affected residents prior to training operations. This may include, but not be limited to: press releases; co-locating postings at trailheads, campgrounds, parking lots, and other existing public



notification locations; inclusion of potential training locations and dates/times on line.

- j) Ensure the NOTAM process is utilized for use of Blackwater Airfield to avoid conflicts with other aviators.
- k) Establish a submittal, response, and resolution process for local residences to submit complaints or other compliance issues to Eglin AFB. This can be accomplished through Eglin's Public Affairs Office.
- l) Coordinate with the FFS to periodically review and update the affected environment condition of each Proposed Action location and update as necessary the operational constraints and/or mitigations identified in this EIS, as well as any of the GLI Protection Level maps if required.
- m) Monitor conditions of high-use training areas, including the hardened camp sites, and LZs/DZs to ensure areas are not overused (e.g., show signs of degradation or adverse impact) and do not expand beyond established boundaries.
- n) Ensure units and operators utilizing emitters are aware of approved site locations for any potentially hazardous emitters.
- o) Evaluate emitter sites on a regular basis to ensure compatibility with safety requirements identified in this EIS.
- p) Coordinate with FWC area biologists for emitter site establishment and use to ensure compatibility.
- q) Survey the areas surrounding existing training areas every two years to ensure that no new noise-sensitive land uses have been established.
- r) Ensure all proposed training activities are within the scope of this EIS. A new AF Form 813 for alterations in the location, timing, or type of activities involved in training operations is required if not previously approved or within the scope of this EIS.
- s) If an activity has the potential to create significant soil disturbance, a gopher tortoise survey will be completed prior to the activity. If a gopher tortoise burrow is found during the survey and cannot be avoided, then Eglin must obtain a gopher tortoise relocation permit from the FWC and conduct the relocation of the tortoise and any commensal species (i.e., indigo snake) in accordance with FWC protocols and the Eglin AFB Indigo Snake Programmatic Biological Opinion (USFWS, 2009).
- t) Identify designated boat landing areas for amphibious operations that occur in Gulf sturgeon and freshwater mussel critical habitat on the Yellow and Ochlocknee rivers, and in Apalachicola Bay and East Bay, preferably with improved surfaces.
- u) Develop and implement a process that will notify Eglin Natural Resources of the dates and locations of upcoming training events to support spot surveys/inspections for compliance.

- v) When determining preferred locations for LZs/DZs, ensure incorporation of 1,000-foot buffers around bald eagle nests from 01 October to 15 May, and wood stork feeding/roosting habitat.
- w) Annually provide ground training units with global positioning system (GPS) coordinates for known sensitive species locations and habitats, including bald eagle nests, and wood stork feeding/roosting habitat.
- x) Survey proposed new training locations (including LZs) for protected/sensitive species, and survey existing training areas at least every three years to identify any new sensitive species that have moved into the area. As necessary, update associated operational constraints and GLI Protection Level maps.
- y) Prior to any activity that has the potential to create significant soil disturbance, conduct a survey for federally listed plants. If listed plants cannot be avoided, additional consultation under the ESA is required.
- z) Prior to any training activities and once specific training areas and corridors are identified for the upcoming year, these areas must be surveyed for bald eagle nests, and active trees must be marked. Coordinate with Eglin Natural Resources and the FFS to ensure that any necessary markings are completed prior to ground operations. Include species with a similarity of appearance to a protected species to unit educational materials that these species not be disturbed. Avoid disturbance of all snakes, not just sensitive snake species
- aa) Prior to any training activities, route requests for land disturbing activities through Eglin AFB and the FFS for approval.
- bb) Follow guidance provided in the Eglin Environmental Guidebooks regarding approved plant and animal species for camouflage and consumption. Develop materials for military members instructing them to avoid inappropriate handling or consumption of wildlife, and clarify to ground troops that diamondback rattlesnakes are not to be consumed.
- cc) Prior to any land disturbance (e.g., tree clearing for LOS), sensitive species surveys must be conducted, and any identified sensitive species and associated habitat must be avoided. If avoidance is not possible, then additional consultation under the ESA is likely to be required.

### ***Before Training***

- 4) Prior to any training activities, Unit personnel must be cognizant of environmental restrictions by:
  - a) Scheduling through Eglin AFB.
  - b) Review the GLI Protection Level maps prior to mission initiation and incorporate RAs into field maps as necessary, particularly for those areas not marked in the field (i.e., RCW buffers and other sensitive species). Units will acquire RCW buffer locations from Eglin AFB and either load these into the GPS devices or add to field maps.

- c) Coordinate with Eglin AFB to schedule an in-briefing on environmental restrictions for Commanders, student trainers, and operational unit personnel prior to first time training at the emitter sites, BRSF and THSF; then at least annually thereafter.
- d) Coordinate the transport, storage, use and disposal of hazardous materials and waste with Eglin AFB.
- e) Coordinate with the Eglin AFB Cultural Resources Section for compliance with the Cultural Resource Landscape Initiative Programmatic Agreement, which identifies requirements for certain activities (i.e., ground-disturbing activities) within the prohibited, restricted, and limited use areas as indicated on the GLI Protection Level maps. Avoidance of these areas is preferred, as activities in these areas may require archaeological survey, mitigations, and consultation with the SHPO. Once training corridors are identified, these areas must be surveyed for RCW cavity trees before training can begin. Coordinate with Eglin Natural Resources to ensure that any necessary species surveys are completed prior to ground operations.
- f) Units must ensure environmental restrictions are communicated to unit personnel that have a ground training requirement, including students, in verbal or written form prior to first time training on BRSF and THSF.
- g) Conduct maintenance and refueling of aircraft, vehicles, and watercraft at Eglin AFB/Hurlburt Field prior to transport to training areas.
- h) Obtain the daily fire danger ratings for the proposed training area, which may restrict the use of munitions depending on the fire rating condition. The fire danger rating is specific to each forest and units will obtain these ratings from each respective state forest before conducting training operations. Adherence to these restrictions is mandatory.
- i) Units must appoint a fire marshal on a daily basis (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while in the field to ensure all personnel have been trained concerning the safe use of incendiary devices and to supervise the immediate suppression of fires.

### ***During Training***

- 5) During training activities, each unit will adhere to the following constraints:
  - a) Follow restrictions shown on the Protection Levels map (as defined in [Table 2-21](#)), and all applicable restrictions detailed in EAFBI 13-212. Electronic or hard copy maps showing these protected areas will be provided to units. These maps will be updated annually or more frequently if needed.
  - b) Restrict training to only those tactical training areas and landing/drop zones scheduled by Eglin AFB. Should there be an encounter with the public during training military personnel would identify themselves and then suspend training activities and move away from the area, yielding to the public user. On roadways and vehicle trails military personnel would yield to the public.
  - c) Per the FFS, conflicts with certain hunting seasons must be avoided (as described in Sections [5.10](#) and [6.10](#)). The GLI Liaison, in coordination with the FFS, will identify associated time constraints on an annual basis.

- d) In the event of unexpected discovery of cultural resources, cease activity in the immediate vicinity; notify the GLI Liaison and Eglin AFB.
- e) Leave any artifacts visible on the ground in place; notify the GLI Liaison and Eglin AFB.
- f) If personnel encounter soil that is discolored or has a chemical odor, immediately cease activity in the area; notify the GLI Liaison and Eglin AFB.
- g) Fueling of vehicles and aircraft is allowed only in LU-2 areas over asphalt or concrete.
- h) Immediate response is required for petroleum, oil, and lubricant (POL) spills. Appropriate containment (e.g., drip pans and secondary containment) during refueling operations and spill response actions, including reporting requirements and disposal, are required. POL products cannot be directed to sewer systems or impervious surfaces (such as grass).
- i) All spills and accidental discharges of petroleum, oils, lubricants, chemicals, hazardous waste or hazardous materials, regardless of the quantity, will be reported. A spill discharge report must be filled out, and the responsible party must provide this spill report to the GLI Liaison and Eglin AFB as soon as possible. Any fire or spill that poses a threat to life, health, or the environment will be reported immediately to the FFS on-site coordinator and to the Eglin AFB Fire Department. The Air Force will also set up Mutual Aid Agreements with the closest fire departments. If the Fire Department declares an emergency condition, they may take control of the situation, including the tasking of the organization's response detail. Spills over 25 gallons are required to be reported to FDEP (through the GLI Liaison).
- j) If any federally or state-listed species is found dead or injured, immediately notify the GLI Liaison and Eglin AFB.
- k) If an indigo snake, FL pine snake, gopher tortoise, or black bear is sighted, military personnel would leave the area leaving the animal left undisturbed and allowed to proceed on their present course. The GLI Liaison and Eglin AFB would be notified.
- l) Comply with hunting, trapping and fishing regulations as identified by the FWC and USFWS. The GLI Liaison must coordinate with the FWS to determine any licenses required, take limits, or activities occurring out of season.
- m) Do not cut down any trees, for any reason. Do not use sensitive vegetation (e.g., protected species) as part of natural resource consumption. Confer with GRASI Liaison and Eglin Natural Resources Section to identify protected vegetation.
- n) Follow Management Guidelines for the *Red-Cockaded Woodpecker on Army Installations* (see *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion, 2013*, Table 4-2).
- o) Activities within 200 feet of identified RCW trees will not exceed two hours.
- p) The GLI Liaison and Eglin AFB must be notified within 24 hours for the following occurrences:

- a. RCW cavity tree (including wildfire damage) is damaged to the point it is unsuitable for nesting or roosting.
- b. RCW cavity trees, cavity start trees or the surrounding soils are inadvertently damaged or disturbed during ground maneuvers.

### *Dismounted Maneuver*

During dismounted maneuver, units will follow these constraints:

- q) Follow restrictions identified in [Table 2-21](#) and on the GLI Protection Level maps.
- r) Avoid concentrated troop movements on steep slopes and in wetlands.
- s) Do not step on, fill, or in any way cause a gopher tortoise burrow to collapse.

### *Land Disturbance*

- t) Point land disturbance is authorized only in LU-2 areas. Digging is only approved in these areas through coordination with the GLI Liaison and Eglin AFB prior to field activities.
- u) No land disturbance within 25 feet of gopher tortoise burrows.
- v) For approved dig activities, fill in holes once training is complete and cover them with pine straw and leaves.

### *Wheeled Vehicles*

During mounted maneuver, units will follow these constraints:

- w) Follow restrictions identified in [Table 2-21](#). Keep ALL vehicles on established roads at all times – approved roadways are designated by the GLI Liaison and FFS. Use only the low water crossings that have been approved by the FFS and the GLI Liaison. Vehicle access will be prohibited at crossings rated in poor condition, and those on known Westfall's clubtail streams. Prior to driving across a low water stream crossing, check for turtles and allow them to clear the crossing before use.
- x) Do not enter Prohibited Areas: these are off-limits to all activities.
- y) Keep vehicles out of eroded areas, gullies and restoration sites and avoid driving on steep slopes due to erosion potential. Avoid driving on roads with erosion issues; report any erosion issues to the GLI Liaison.
- z) Disposal/discharge of hazardous materials to the ground or in water is prohibited. Follow Eglin and/or FFS spill prevention and spill response procedures. Ensure compliance with all responsibilities as outlined in EAFBI 32-7003, Hazardous Waste Management.
- aa) Prior to use on BRSF and THSF, and prior to use again at Eglin AFB, inspect all out-of-area equipment for invasive non-native species, and clean in accordance with Armed Forces Pest Management Board Technical Guide No. 31, Retrograde Washdowns: Cleaning and Inspection Procedures: <http://www.afpmb.org/pubs/tims/tg31/tg31.pdf>.

### *Bivouacking*



- bb) Return bivouac area to as natural an appearance as possible.
- cc) Campfires are not authorized except at hardened camp sites with prior approval through the GLI Liaison and Eglin AFB. The fire danger rating for each forest must be checked and BRSF and THSF dispatch must be notified if any campfires are proposed. If any fires are approved, units must follow forest-specific restrictions as identified by the respective forest fire dispatch.
- dd) Minimize water consumption from rivers and streams.
- ee) Do not dam or divert water from streams or wetlands.
- ff) Do not use soap or other cleaners in streams or ponds.
- gg) Pack out trash. At no time will trash be buried or burned in a tactical area.
- hh) Use chemical latrines for human waste disposal whenever possible during field training missions and only in areas approved by the FFS. When chemical latrines are not available, a cat-hole latrine or saddle trench latrine can be used in accordance with service command directives.
- ii) Hardstand and tent complex bivouacs are permitted only in previously cleared and disturbed areas around the perimeter of LZs and DZs.

#### *Expendable Use*

- jj) Follow restrictions identified in [Table 2-21](#) and on the GLI Protection Level maps.
- kk) Follow restrictions identified in [Table 2-22](#) and on the GLI Protection Level maps.
- ll) At BRSF, use of noise-generating expendables is restricted to the hardened camp sites. Live rounds are not authorized.
- mm) Under the Proposed Action at THSF use of noise-generating expendables is restricted to those areas shown on the GLI Protection Level maps; live rounds are not authorized. Under Subalternative 1 no noise-generating expendables are authorized at THSF.
- nn) Portable generators must be approved by the GLI Liaison, Eglin AFB and FFS, and used in accordance with each respective policy, including containment measures and spill kits.
- oo) Do not use concertina/barbed wire; obstacles must be manned, and Units must remove all obstacles once training is complete.
- pp) Do not throw smokes, flares, or simulators directly into a water body.
- qq) Avoid deposition of blank casings, marking cartridges, Chem-lites, and pyrotechnics debris into water.
- rr) Do not release chemicals or metals into streams, wetlands, or water bodies.
- ss) Do not release toxic aerosols within 300 feet of streams, wetlands, or water bodies.

- tt) Abandoning, dumping, burying or otherwise concealing munitions, pyrotechnics or residue from these items, including packing materials is prohibited.
- uu) Recycle munitions cartridges and dispose of debris from other expendables in accordance with Eglin AFB and FFS operating procedures.
- vv) Check the FFS Fire Danger Index (FDI) daily and coordinate with the on-site FFS dispatch prior to initiation of field activities. Fire danger-specific restrictions on pyrotechnics use and campfires will be established cooperatively between the FFS and Eglin Wildland Fire Program. Restrictions will generally be as follows: On days when the local state forest Fire Danger Rating is Very High or Extreme, no pyrotechnics use or campfires will be allowed without prior approval of the Eglin Wildland Fire Program Manager and the state forest Fire Manager. For days with High Fire Danger, pyrotechnics will be restricted to hand-thrown simulators and smoke grenades, and are to be used only on roads or in pits; no campfires are allowed.
- ww) Conduct a fire check (visual observation) after the use of pyrotechnics or munitions; duration of the check will be dependent on the Fire Danger Rating.
- xx) When a fire is started in a tactical area, the officer in charge will stop all training and concentrate on fighting the fire using all available personnel in accordance with guidance established in Chapter 6, Fire Fighting, of EAFBI 13-212.
- yy) Report wildfires immediately to the GLI Liaison, Eglin AFB and FFS Fire Dispatch, giving the location by coordinates or other recognizable geographic reference, when possible.
- zz) Follow the Management Guidelines for the Red-Cockaded Woodpecker on Army Installations (U.S. Army, 2007) as identified in the *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion* (U.S. Air Force, 2013), Table 4-2.
- aaa) Coordinate with the GLI Liaison and Eglin AFB to repair any damage caused to sensitive habitats due to wildfires caused by training missions.
- bbb) Coordinate with the GLI Liaison and Eglin AFB to ensure the following Air Force Instruction (AFI) 32-7064 requirement is met: User groups responsible for wildfire starts are required to ensure that sufficient resources (i.e., fire management personnel and equipment) are available to respond to wildfires.

### *Air Operations*

#### Units/pilots will:

- ccc) Use only the approved LZs/DZs.
- ddd) Follow restrictions in Table 2-25 and consult Eglin AFB and the GLI Protection Level maps for other restrictions associated with flight operations and incorporate these into flight plans.
- eee) Digging is prohibited within the boundaries of LZs.
- fff) Minimize driving on dirt LZs/DZs as such practice may result in increased maintenance requirements for the areas and create hazards for aircraft landings.

- ggg) Notify GLI Liaison and Eglin AFB of any landing zone that shows signs of overuse.
- hhh) Follow Eglin spill prevention and spill response procedures. The Air Force will set up Mutual Aid Agreements with the closest fire departments.
- iii) Coordinate through the GLI Liaison and Eglin AFB the need for any land clearing or improvements for a landing zone.
- jjj) Suspend CV-22 landings on days with a high or greater fire danger rating.

#### *Amphibious Operations*

- kkk) Training activities must avoid identified recreational sites and public boaters.
- lll) No power motors are allowed in Bear Lake (BRSF).
- mmm) Utilize only those landing sites designated by the GLI Liaison, through coordination with the FFS.
- nnn) Prevent erosion of heavily used shoreline areas through restoration/stabilization, rotational use, and avoiding contact with emergent vegetation along banks and shorelines.
- ooo) Notify the GLI Liaison and Eglin AFB of any shoreline/bank areas that show signs of overuse.
- ppp) Avoid contact of boat propellers with submerged vegetation (i.e., seagrass beds)
- qqq) Keep boats clean to prevent introduction of invasive or nonnative species from other aquatic environments. Out-of-town units must be verified clean before using them in local rivers, creeks and estuaries.

#### *After Training*

6) After training operations, units will follow these restrictions:

- a) Police training areas to ensure that no trash, ammunition boxes, wire, or other debris has been left in the area and all excavations are filled. Take to appropriate landfill or recycling points.
- b) Coordinate with the GLI Liaison and Eglin AFB on random site surveys to detect environmental impacts by providing requested information.
- c) Coordinate with the GLI Liaison and Eglin AFB to correct or repair environmental impacts caused by training activities
- d) Report excessive damage to roads, vegetation, or training assets (i.e., LZs/DZs) to the GLI Liaison and Eglin AFB. Damage must be assessed and necessary corrective measures taken.

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## **2.6 ALTERNATIVE IMPACT ANALYSIS SUMMARY**

The following provides an impact summary of the analyses presented in Chapters [3](#), [4](#), [5](#), and [6](#). Details on each specific action and the potential impacts as related to the

respective location can be found in these chapters. The significance of impacts was determined by evaluating the context, intensity, and duration of the action (40 CFR 1508.27) and the relative effect on individual resources. This process is further detailed in Chapter [3](#).

Impacts were evaluated with consideration of implementation of General Operational Constraints inherent to the Proposed Action and Subalternative 1 associated with EAFB operational procedures and other NEPA-related documents for similar actions occurring on the Eglin Range on similar resources, as discussed previously in Section [2.3.2](#), *Training Activities in Northwest Florida State Forests*. General Operational Constraints are a prerequisite for implementing the Proposed Action and Subalternative 1. Once analyses were completed, additional Proposed Resource-Specific Mitigations were identified to avoid or minimize adverse impacts to impacted resources. All General Operational Constraints were previously described in Section [2.5](#); all Proposed Resource-Specific Mitigations identified through analyses are provided in Section [2.7](#).

Significance of impacts is determined by considering how the Proposed Action and Subalternative 1 interact with the various resources in terms of context, intensity, and duration as described in each respective Chapter [3](#) resource section. Context can be analyzed in terms of society as a whole (human, national), the affected region, the affected interests, and the locality. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than across a broad region.

*Intensity* refers to the severity of the identified impact, while *duration* considers the long-term and short-term nature of the potential impact. The impact analyses considers direct, indirect, and cumulative impacts on resources along with how both beneficial and adverse impacts affect public safety, the characteristics of the geographic area and proximity of the Proposed Action and Subalternative 1 to sensitive resources, the potential controversial nature of the potential impact, whether possible effects are highly uncertain or involve unique or unknown risks, whether the action may establish a precedent for future actions with significant effects, cumulative impacts, impacts to cultural resources or endangered species, and whether the Proposed Action and/or Subalternative 1 threatens to violate federal, state, or local laws or environmental protection requirements. Each of these aspects is addressed as appropriate in the applicable resource area sections and chapters in this EIS. General criteria for impacts to resource/issue areas are summarized below and are presented relative to individual resource/issue areas at each proposed location in [Table 2-23](#):

- **Beneficial** – Beneficial impacts may occur under any context, intensity, or duration. These generally result in some benefit or overall improvement to the resource impacted by the action. Such impacts may include a reduction in air emissions or restoration of habitats; the scope of the impact is directly related to the context, intensity, and duration of the impact. Elimination of baseline air emissions or restoration of large areas of disturbed wetland may be considered significant beneficial impacts, while a small reduction in baseline air emissions or restoration of a small pocket of wetlands may be considered beneficial but relatively insignificant. Other than providing benefits to Air Force training

capabilities, the Air Force has not identified any significant or insignificant beneficial impacts under the Proposed Action or Subalternative 1.

- **Adverse** – Adverse impacts generally result in detriment or degradation of the impacted resource, the degree or level of impact directly related to the context, intensity, and duration of the impact. The Air Force has identified the potential for adverse impacts for several resource areas; resources experiencing potential adverse impacts are shaded yellow in [Table 2-23](#). Adverse impacts can either be significant or insignificant.
  - **Significant** – Physical aspects are easily perceptible, and typically endure over the medium-to-long term, with a regional context and a high intensity; however, significant impacts can occur potentially over the short term under any context given a high intensity. Significant adverse impacts are typically not recoverable over the short term, and require long term recovery processes with extensive mitigation or revision of Proposed Action or Subalternative 1 to avoid or minimize impacts. An example of a significant adverse impact would be destruction of large percentages of wetland areas or degradation of water quality that may affect human health and the environment.
  - **Insignificant** – These impacts are typically short- to medium-term impacts under any context or intensity. Beneficial impacts that are not significant in nature may include restoration of small pockets of wetlands. Adverse but not significant impacts are typically recoverable over the short-to-medium term with mitigations required to minimize level of impact or potential for impact, the extent of mitigation dependent on the identified context and intensity of the impact. Examples of adverse impacts that are not significant may be short, intermittent increases in noise to transient recreational users that do not affect overall usability of the forest or the potential for localized, intermittent soil erosion on stream banks due to troop movement over the land-water interface during dismounted movements and amphibious operations. These are recoverable impacts over the short term through Proposed Resource-Specific Mitigations to avoid noise-sensitive areas for training in the case of noise impacts and, for soil impacts, minimizing the size of troop units conducting ground training activities, rotating land-water interface ingress/egress points, and not using ingress/egress points that show signs of erosion.
- **Neutral or No Effect** – These are impacts that are typically of a low-intensity, such that they are imperceptible regardless of context or duration. Such impacts, whether beneficial or otherwise, are recoverable over the short term without mitigation and result in no overall perceptible change to the resource. Resources experiencing neutral or no effects are identified as “green” in [Table 2-23](#).

Overall, the Air Force has not identified any significant beneficial or significant adverse impacts associated with the Proposed Action or Subalternative 1. While the Air Force has identified the potential for adverse impacts to various resources, these impacts



would be insignificant based on the context, intensity, and duration of the identified impacts as described throughout Chapters 3, 4, 5, and 6. Additionally, by virtue of the reduced scope of Subalternative 1 (i.e., reduced frequency, location, and number of proposed activities) impacts would be less than those identified under the Proposed Action.

**Table 2-23. Summary of Impacts**

Resource Area	Proposed Action			No Action
	Emitter Sites	Blackwater River State Forest	Tate's Hell State Forest	
Airspace	Sections <a href="#">3.2/4.2</a>	Sections <a href="#">3.2/5.2</a>	Sections <a href="#">3.2/6.2</a>	Chapter <a href="#">8</a>
Noise	Sections <a href="#">3.3/4.3</a>	Sections <a href="#">3.3/5.3</a>	Sections <a href="#">3.3/6.3</a>	
Safety	Sections <a href="#">3.4/4.4</a>	Sections <a href="#">3.4/5.4</a>	Sections <a href="#">3.4/6.4</a>	
Air Quality	Sections <a href="#">3.5/4.5</a>	Sections <a href="#">3.5/5.5</a>	Sections <a href="#">3.5/6.5</a>	
Earth Resources	Sections <a href="#">3.6/4.6</a>	Sections <a href="#">3.6/5.6</a>	Sections <a href="#">3.6/6.6</a>	
Water Resources	Sections <a href="#">3.7/4.7</a>	Sections <a href="#">3.7/5.7</a>	Sections <a href="#">3.7/6.7</a>	
Biological Resources	Sections <a href="#">3.8/4.8</a>	Sections <a href="#">3.8/5.8</a>	Sections <a href="#">3.8/6.8</a>	
Cultural Resources	Sections <a href="#">3.9/4.9</a>	Sections <a href="#">3.9/5.9</a>	Sections <a href="#">3.9/6.9</a>	
Land Use	Sections <a href="#">3.10/4.10</a>	Sections <a href="#">3.10/5.10</a>	Sections <a href="#">3.10/6.10</a>	
Socioeconomics/ Environmental Justice	Sections <a href="#">3.11/4.11</a>	Sections <a href="#">3.11/5.11</a>	Sections <a href="#">3.11/6.11</a>	
Hazardous & Solid Materials/Waste	Sections <a href="#">3.12/4.12</a>	Sections <a href="#">3.12/5.12</a>	Sections <a href="#">3.12/6.12</a>	
Infrastructure/ Transportation	Sections <a href="#">3.13/4.13</a>	Sections <a href="#">3.13/5.13</a>	Sections <a href="#">3.13/6.13</a>	
Subalternative 1				
Airspace	Sections <a href="#">3.2/4.2</a>	Sections <a href="#">3.2/5.2</a>	Sections <a href="#">3.2/6.2</a>	Chapter <a href="#">8</a>
Noise	Sections <a href="#">3.3/4.3</a>	Sections <a href="#">3.3/5.3</a>	Sections <a href="#">3.3/6.3</a>	
Safety	Sections <a href="#">3.4/4.4</a>	Sections <a href="#">3.4/5.4</a>	Sections <a href="#">3.4/6.4</a>	
Air Quality	Sections <a href="#">3.5/4.5</a>	Sections <a href="#">3.5/5.5</a>	Sections <a href="#">3.5/6.5</a>	
Earth Resources	Sections <a href="#">3.6/4.6</a>	Sections <a href="#">3.6/5.6</a>	Sections <a href="#">3.6/6.6</a>	
Water Resources	Sections <a href="#">3.7/4.7</a>	Sections <a href="#">3.7/5.7</a>	Sections <a href="#">3.7/6.7</a>	
Biological Resources	Sections <a href="#">3.8/4.8</a>	Sections <a href="#">3.8/5.8</a>	Sections <a href="#">3.8/6.8</a>	
Cultural Resources	Sections <a href="#">3.9/4.9</a>	Sections <a href="#">3.9/5.9</a>	Sections <a href="#">3.9/6.9</a>	
Land Use	Sections <a href="#">3.10/4.10</a>	Sections <a href="#">3.10/5.10</a>	Sections <a href="#">3.10/6.10</a>	
Socioeconomics/ Environmental Justice	Sections <a href="#">3.11/4.11</a>	Sections <a href="#">3.11/5.11</a>	Sections <a href="#">3.11/6.11</a>	
Hazardous & Solid Materials/Waste	Sections <a href="#">3.12/4.12</a>	Sections <a href="#">3.12/5.12</a>	Sections <a href="#">3.12/6.12</a>	
Infrastructure/ Transportation	Sections <a href="#">3.13/4.13</a>	Sections <a href="#">3.13/5.13</a>	Sections <a href="#">3.13/6.13</a>	

Impacts to public health and safety would be either avoided or minimized through implementation of operational constraints and mitigations. Any unique geographic characteristics (e.g., sensitive habitats, areas prone to erosion) associated with the proposed emitter or training sites would be avoided, and any potential adverse impacts to the quality of the human environment would be minimal (mainly the potential for occasional annoyance to recreational users from noise). There are no unknown risks or

impacts that may be considered controversial in nature associated with emitter site use or training activities (such actions have been extensively analyzed in this EIS and other Air Force documents as referenced in this EIS), and the Proposed Action is not precedent setting because the DoD utilizes public lands throughout the United States for both emitter sites and military training. Adverse impacts to cultural resources and endangered species have been identified; however, these impacts would also be minimized/mitigated through implementation of operational constraints and mitigations as identified through consultation under the NHPA and the ESA, respectively. Additionally, the use of emitter sites and conduct of training activities would comply with all federal, state, and local laws. Finally, the Air Force has not identified any significant potential for cumulative impacts (as discussed in Chapter 7). Therefore, based on the context, intensity, and duration of impacts identified in this EIS, the Air Force has not identified significant beneficial or adverse impacts under the Proposed Action and Subalternative 1.

The following section summarizes impacts for each resource area identified in yellow in [Table 2-23](#), which represents potential insignificant adverse impacts. Resources experiencing neutral or no effects are identified as “green” in [Table 2-23](#) and are not discussed in this summary. More detail on all impacts can be found in the respective resource-specific discussions provided in the associated sections by clicking on the links in the table.

### **Emitter Sites**

The potential for adverse impacts has been identified at four proposed emitter sites. Impacts are associated with the emitter safety hazard distance (SHD) and proximity to inhabited FFS administrative buildings, thus resulting in potential safety issues, land use conflicts, and associated socioeconomic/environmental justice impacts at those particular sites. However, this impact can be avoided through mitigation actions described in Section [2.7](#).

### **Training Activities**

#### ***Airspace Management***

Under both the Proposed Action and Subalternative 1 airspace management impacts would be regional and would include some positive impacts (i.e., reduced scheduling conflicts at Eglin Range) and some negative impacts (i.e., increased air traffic in controlled and uncontrolled airspace over BRSF and THSF). Impacts on scheduling and coordination processes would be moderate. Implementation of a coordination process between the Air Force and FFS would avoid potential operational conflicts that otherwise could have been considered severe. Potential increases in scheduling demand for SUAs over BRSF would be expected to be minor. At THSF, although the number of sorties using Tyndall MOAs would be expected to increase, about 50 percent of GLI training operations would occur after sunset when the Tyndall MOAs are not active. Impacts to ongoing operations would be expected to be minor as the proposed GLI training would not require blocking off a volume of airspace to be used exclusively by Air Force aircraft. Other operations would be able to continue to transit the area while GLI training is under way. Impacts would last for the entire life of the action, as air traffic tempo over the state forests would remain slightly elevated for as long as GLI

training continues to occur. However, based on analysis of the context and intensity factors as described in Section [3.2.1.2](#), the Air Force has not identified any significant airspace-related impacts under the Proposed Action or Subalternative 1.

### **Noise**

At BRSF under the Proposed Action and Subalternative 1 noise generating expendables would only be utilized at the STOP Camp and SRYA site. At THSF, under the Proposed Action noise generating expendables may be used in areas that are not restricted according to operational constraints and mitigations, while under Subalternative 1 noise generating expendables would not be used at THSF. Noise associated with aircraft operations and noise-generating expendable use under both the Proposed Action and Subalternative 1 would result in annoyance to some recreational users and residences. However, based on analysis of the context and intensity factors as described in Section [3.3.1.2](#), implementation of operational constraints identified in Section [2.5](#), and identified Proposed Resource-Specific Mitigations discussed in Section [2.7](#), the Air Force has not identified any significant noise impacts that would affect public health or safety. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse noise impacts than the Proposed Action given the reduced frequency, duration, and locations of noise-generating activities.

### **Safety**

There is the potential for increased wildfire occurrences associated with training activities under the Proposed Action and Subalternative 1 – wildfire occurrence could result in adverse impacts to several resource areas. While the potential for increased wildfire occurrence probability cannot be completely avoided under implementation of the Proposed Action, the constraints and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [2.7](#), respectively, serve to minimize the potential for wildfire probability and provide mechanisms for adequate wildfire response. As a result, based on analysis of the context and intensity factors as described in Section [3.4.1.2](#), the Air Force has not identified significant impacts that would affect public health or safety under either action alternative. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse safety impacts than the Proposed Action given the reduced frequency, duration, and locations of training activities.

### **Air Quality**

Training activities would result in small amounts of air emissions, the majority of which would not result in adverse impacts at either forest under either action alternative. Air emissions from the Proposed Action or Subalternative 1 would not adversely impact public health or safety or negatively affect the quality of the human environment on an action-specific or cumulative basis. Overall, Subalternative 1 would be expected to result in substantially less potential for air emissions than the Proposed Action given the reduced frequency, duration, and locations of training activities. All emissions would be within federal, state, and local guidelines. Consequently, based on analysis of the context and intensity factors as described in Section [3.5.1.2](#), the Air Force has not identified significant air quality impacts.

### ***Earth Resources***

There are unavoidable adverse impacts under the Proposed Action and Subalternative 1 associated with minor soil erosion resulting from roadway vehicle use, LZ/DZ use, ground movement, and amphibious operations. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse impacts to earth resources than the Proposed Action given the reduced frequency, duration, and locations of ground disturbing activities. No National Pollutant Discharge Elimination System (NPDES) permitting requirements have been identified. The intensity of these impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section [2.5](#) and [3.6.4](#), respectively. Consequently, based on analysis of the context and intensity factors as described in Section [3.6.1.2](#), the Air Force has not identified any significant adverse impacts to earth resources.

### ***Water Resources***

Context and intensity factors utilized in water resources analyses are provided in Section [3.7.1.2](#). Under both action alternatives there are unavoidable direct adverse impacts to wetlands and floodplains from incidental surface disturbances (ISDs) associated with ground movement (e.g., troops walking through wetlands) and amphibious operations (e.g., boats landing along the shoreline), as well as potential for sedimentation associated with vehicles using stream and wetland crossings. However, the Air Force has not identified any significant adverse impacts to water resources under the Proposed Action or Subalternative 1 because the intensity of any of the identified impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [2.7](#), respectively. No land development activities have been proposed and no United States Army Corps of Engineers (USACE) Section 404 permitting requirements for impacts to wetlands have been identified. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse water resource impacts than the Proposed Action given the reduced frequency, duration, and locations of training activities.

### ***Biological Resources***

Under both the Proposed Action and Subalternative 1 training activities would be restricted around known sensitive species locations and habitat. There are unavoidable adverse impacts to biological resources from incidental disturbances associated with dismounted maneuvers (e.g., potential trampling of a transient species by foot traffic), aircraft noise, and amphibious operations (disturbance along shorelines). These impacts would be of minor intensity and short-term in duration. Direct unavoidable impacts have also been identified associated with increased wildfire potential resulting from training activities. The intensity of any of the identified impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section [2.5](#) and [2.7](#), respectively. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse impacts to biological resources than the Proposed Action given the reduced frequency, duration, and locations of training activities. The Air Force completed consultation with USFWS in accordance with Section 7 of the ESA on April 8, 2014, and has received

concurrence on a finding of “Not Likely to Adversely Affect” sensitive species or habitat (USFWS, 2014). A copy of the Biological Assessment and all associated correspondence is included in Appendix C, *Consultation Documentation*. Therefore, the Air Force has not identified any significant adverse impacts to biological resources under the Proposed Action, or Subalternative 1, based on context and intensity factors described in Section [3.8.1.2](#).

### **Cultural Resources**

Context and intensity factors utilized in cultural resources analyses are provided in Section [3.9.1.2](#). Under both the Proposed Action and Subalternative 1 potential adverse impacts to cultural resources may occur from land disturbance activities, dismantled movement, and amphibious operations due to ground disturbance. Impacts mainly consist of potential disturbance or inadvertent discovery of previously unidentified cultural resources in both surveyed and unsurveyed areas. Under the Proposed Action ground disturbing activities would be limited in unsurveyed areas, and known cultural resource locations would be avoided as part of general operations constraints (see Section [2.5](#)). Under Subalternative 1 all LZs/DZs would require surveys prior to use. If cultural resources are identified in these areas the LZs/DZs would not be utilized. The Air Force has notified the ACHP, Florida SHPO, and applicable Native American tribes about this Proposed Action. The Air Force has completed a Programmatic Agreement to meet its requirements under Section 106 of the NHPA, which would apply to both the Proposed Action and Subalternative 1. The final Programmatic Agreement and results of the consultation process are included in Appendix C of the Final EIS.

### **Land Use**

The amount of land area proposed for use under either action alternative less than one-half of one percent of the total areas for the forests. Temporary annoyance to transient recreational users from noise during training activities is unavoidable under both action alternatives. Overall, Subalternative 1 would be expected to result in substantially less potential for adverse land use impacts than the Proposed Action given the reduced frequency, duration, and locations of training activities. Impacts to recreational users and adjacent landowners would be minimized through implementation of operational constraints identified in Section [2.5](#), and avoidance of noise-sensitive areas. There would be no area closures associated with either action alternative. LZs/DZs would be surveyed prior to use and if members of the public are in the area the LZ/DZ would not be utilized. Activity buffers would be placed around the Florida Natural Scenic Trail, as well as designated horse trails to prevent user conflicts in these areas (see Section [2.5](#)). At BRSF, the STOP Camp and SRYA sites are currently not open to the public, and this would not change if the Air Force utilizes these locations. Conflicts with hunters would be avoided because training would be restricted in certain areas during hunting seasons in coordination with the FFS so as to not interfere with various hunting seasons. While the impacts are adverse because the quality of the recreational experience may be somewhat diminished by these impacts, this would not preclude recreational use or cause general incompatibility, and impacts would be short term. Therefore, the Air Force does not consider the impacts to be significant based on the context and intensity of identified impacts under factors discussed in Section [3.10.1.2](#).



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## 2.7 PROPOSED RESOURCE-SPECIFIC MITIGATIONS

Based on the scope of activities associated with the action alternatives, the inherent General Operational Constraints identified in Section 2.5, and related impact analyses detailed in this EIS, there are no identified Resource-Specific Mitigation impact minimization procedures necessary for the following resource areas: air quality, solid/hazardous materials and waste, and infrastructure and transportation.

Impact analysis of the action alternatives has identified the following Proposed Resource-Specific Mitigations that would be implemented, in addition to General Operational Constraints in Section 2.5, to further minimize or avoid adverse impacts—in most cases impacts would be minimized such that impact levels would be reduced from “adverse” (yellow) to “neutral” or “no effect” (green).

The identified mitigations would be incorporated into a Mitigation Plan. This plan, would be a “living document” that would be reviewed and updated as required on an annual basis by the GLI Liaison and L.I.T. to ensure mitigation applicability and effectiveness.

### Emitter Sites

Due to the presence of structures within the JTE SHD, this emitter system would not be utilized at the following sites: EAFB-1, FFS-5, FFS-6, and FFS-7.

At each site continue to monitor the proximity to populated areas to determine constraints associated with the site and respective operational parameters of the specific system.

Prior to any land disturbance (e.g., tree clearing) sensitive species surveys would be conducted. Any identified sensitive species or associated habitat would be avoided. The Air Force will coordinate with FWC area biologists on emitter site establishment and use to ensure compatibility.

### Both Forests

The Air Force would post signs collocated with existing Forest Service signage and in Forest Service stations notifying forest users of the potential for encountering training in the forest. This would provide public awareness of training activities in the forest. Users expecting to encounter training activities and intermittent noise may be more prepared for such encounters and, therefore, less surprised or annoyed by training events.

### Airspace Management

A coordination process would be established by which the Air Force would work with FFS points of contact (POCs) prior to scheduling missions to ensure that FFS operations and recreational aviation activities would not be negatively impacted by GLI training.

### Noise

Aircraft would not operate below 500 feet AGL except while engaged in approaches to, departures from, or training at designated LZs/DZs or OHO locations.

LZs/DZs would be sited at not less than 2,200 feet from known noise-sensitive locations. Known noise-sensitive locations include campgrounds, hiking/horseback riding trails, stables, and privately owned parcels with at least one residential structure.

Maneuvers near the LZ/DZ (i.e., initial approach, departure, circling, and pattern work at less than 500 feet AGL) would not be conducted at distances less than 200 feet from known noise-sensitive locations.

OHO locations would not be located within 2,200 feet of known noise-sensitive locations.

### ***Earth Resources***

Utilize sites that are best suited to the intended activity and avoid areas with known constraints or limitations.

Temporally and spatially disperse LZ/DZ training to minimize repetitive use impacts to landing zone surface conditions and maximize life cycles. Utilize mission logistics information to plan training events that avoid, to the degree possible LZ/DZ areas used during the previous two years. A rest period would promote vegetative growth and allow disturbed areas to recover.

As needed, install BMPs to minimize soil disturbances (Florida Department of Agriculture and Consumer Services [FDACS] 2008, USACOE 2004 and 2008).

Avoid LZ/DZ areas with highly and potentially highly erodible soils and hydric soils. Soil erosion potentials increase with increasing soil erodibility and wet soil are highly sensitive to damage by compaction and rutting.

Maintain at least a 100-foot exclusion buffer around sensitive steephead slopes and closed depression subsidence areas to prevent accelerated soil erosion of slopes and wet soil rutting.

As necessary, install temporary metal landing mats for LZ/DZ landing training activities conducted in wet areas during poor weather conditions. Mats can reduce potentials for soil damage and provide stable platforms for aircraft landings, materials and personnel loading and unloading, and temporary storage.

To the degree possible, utilize established walking trails or designated roads during cross county dismounted maneuvers.

Avoid cross-county maneuvers through steephead locations. The steep to very steep slopes of these geologic features are highly prone to accelerated rates of erosion if disturbed.

Avoid the use of borrow pits for temporary campsites. For some pits, additional surface disturbances could increase soil erosion rates or affect the stability of early-stage pit reclamation.

Avoid establishing temporary camps within or in proximity to steepheads and closed depression areas. These sites may be sensitive to increases in stormwater runoff of disturbances associated with camp activities. An exclusion zone of at least 100 feet is recommended.

Avoid sensitive streambank areas that are overheightened and oversteepened and/or areas exhibiting bank scour and mass failure features.

To the degree possible, avoid the repetitive use of the same nonhardened egress and ingress locations within the same year for amphibious operations.

For sites where vegetation damage could result in loss of plant cover, reseed with native species to encourage the reestablishment of vegetative cover.

### **Water Resources**

Use only FFS-approved, designated vehicle water crossings in “Good” or “Fair” condition; no wheeled vehicle training would occur at crossings rated “Poor” until these crossings are approved by the FFS. Report any damaged water crossings identified in the field to the GLI Liaison and Eglin AFB.

If off-road vehicle use is required for any reason the respective FFS Management Office would need to be consulted prior to occurrence, and no vehicles would be allowed within 100 feet of a surface water body or wetland as specified by EABFI 13-212.

To minimize localized damage potential from foraging and dismounted troop movements, the size of troop units will be kept to small manageable numbers. Over time, activities would be rotated within and among TAs to prevent concentration of activities in particular locations. Implementation of this mitigation would allow water resources to recover from extended use after intensive training activities.

Roads, trails, and stream/wetland crossings would be inspected before and after each training mission to identify maintenance issues that could cause problems if not repaired. Training activities would be shifted or redirected if conditions of roads and stream and wetland crossings require repair or other measures to prevent erosion from impacting surface waters and wetlands. The FFS will be notified of any identified issues.

Amphibious operations should use designated landing sites as coordinated through the GLI Liaison and the FFS. To the extent possible, boat landings should occur on established, hardened boat ramps for ingress/egress of amphibious craft. If ingress/egress must utilize natural habitat in wetlands, care should be taken to prevent destruction of wetland vegetation or other activities that might cause shoreline erosion. Ingress/egress points at nonhardened locations for both personnel and watercraft should be rotated to the extent possible to allow sites time to recover from amphibious operations.

### **Biological Resources**

No resource-specific mitigations have been identified outside of those requirements associated with the ESA Section 7 consultation for this action, as provided in Appendix C, *Consultation Documentation*. The consultation requirements have been incorporated into the Operational Constraints because they are required to be implemented as part of the Proposed Action/Subalternative 1.

### **Cultural Resources**

Resource-specific mitigations for cultural resources have been identified in the Final *Programmatic Agreement among Eglin Air Force Base and The Florida Historic*

*Preservation Officer Regarding the Proposed Gulf Regional Airspace Strategic Landscape Initiative* (PA) as provided in Appendix C, *Consultation Documentation*. The PA identifies specific requirements associated with avoidance and/or minimization of potential impacts to cultural resources that would apply to both the Proposed Action and Subalternative 1. Such requirements (located in stipulations, Section VI, Resolution of Adverse Effect of the PA) include: avoidance and preservation in-place of resources; and using flagging, signage, and temporary fencing or other such measures around the limits of the property. More detailed information is provided in the Final signed PA located in Appendix C, *Consultation Documentation*.

### **BRSF Only**

#### **Noise**

Aircraft inbound to and outbound from LZs/DZs would avoid overflying privately owned parcels with residential structures where practicable, and would avoid overflights below 500 feet over the Florida Natural Scenic Trail and the TA-5 horse riding area and stable(s).

LZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be permitted in the northern half of Blackwater Airfield. Approaches to and departures from Blackwater Airfield would be conducted from/to the north to avoid low overflight of a campground. Aircraft departing Blackwater Airfield would initiate takeoff roll from about the center point of the airstrip.

Under Subalternative 1 expendable use would be limited to the hardened camp sites. Under both the Proposed Action and Subalternative 1 the Air Force would notify residents within 4,000 feet of the SRYA or former STOP camp prior to use of training munitions.

### **THSF Only**

#### **Noise**

Under the Proposed Action noise-generating expendables would not be used within 4,000 feet of noise-sensitive locations (e.g., residences, campgrounds and recreational sites). [Figure 6-1](#) through [Figure 6-22](#) show the areas in which training activities would be restricted. Buffers are established from all privately-owned parcels containing at least one residential structure and all campgrounds.

Under Subalternative 1 there would be no noise-generating expendable use at THSF.

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### 3. PROPOSED ACTION AFFECTED RESOURCE ASSESSMENT

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#### 3.1 INTRODUCTION

In accordance with 40 CFR 1501.7(3) (Scoping), this chapter focuses on identifying and eliminating from detailed study issues that are not significant or that have been covered by prior environmental review (§1506.3). Thus, these issues are only discussed briefly here, addressing why they would not significantly affect the human environment and/or where they have been covered under other environmental studies (if applicable). Each map in this chapter is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.

This chapter details which resource/issue areas would be potentially adversely affected under the Proposed Action, based on preliminary analysis. These resource areas were carried forward for further, location-specific analyses, detailed in Chapters [4](#), [5](#), and [6](#). The affected resource areas were determined by:

- Categorizing the Proposed Action activities into “effectors.”
- Identifying the potential interactions between effectors and resource/issue area “receptors.”
- Discussing the regulatory drivers associated with each receptor.
- Providing the analysis methodologies utilized in this EIS for each resource/issue area receptor.
- Defining impact level attributes and potential for significance in each analysis methodology.
- Conducting general analysis of emitter activity and training activity effectors to identify potentially adverse impacts on associated receptors and determine those resources/issue areas to be carried forward for location-specific analyses (Chapters [4](#), [5](#), and [6](#)).
- Identifying any Proposed Resource-Specific Mitigations needed to minimize or avoid adverse impacts identified through general analyses. Additional Proposed Resource-Specific Mitigations were identified in subsequent site-specific analyses, as needed.

Utilizing this approach ensures that impacts are discussed in proportion to their significance, with only brief discussion of issues deemed not significant (40 CFR 1502.2 [b] [Implementation]).

#### ***Effectors and Receptors***

Assessment of affected resources begins by first categorizing a proposed action into key effectors based on the scope of the proposed activities and the resulting potential environmental interactions. An *effector* is an aspect of a training activity that may have an effect on the environment. Each proposed activity comprises these effectors in some form, some more than others. Once effectors are known, the resources that might be affected are identified as *receptors*. As an example, training activities involve varying degrees of land disturbance that interact with several different resources, such



as soils and water resources. Land disturbance is considered an effector, and each resource affected by land disturbance activities is considered a receptor.

The following have been identified as the key effectors of the Proposed Action:

- Land disturbance. Actions associated with changing the landscape through the disturbance of natural resources further defined by the following:
  - Land development. Land clearing, grading, construction, etc. Activity may disturb several hundred square feet or more and may extend from the surface to more than 12 inches below the ground surface. NOTE: The only potential land development proposed as part of the Proposed Action or Subalternative 1 is associated with the emitter sites due to the need for the potential installation of fencing.
  - Point impacts. Small-scale point impacts, such as placing a tent stake or picket into the ground or digging a small hole. Disturbance is very localized and extends less than 12 inches below the ground surface.
  - Incidental surface disturbance. Small-scale surface disturbance incidental to other training activities, such as personnel walking around an LZ, emitter site, or generally walking around a specific training site.
  - Consumption. Utilization of natural resources through direct consumption (i.e., eating plants or animals).
- Ground movement. Movement of troops and vehicles across the training environment further categorized as follows:
  - Wheeled vehicles. Utilization of trucks, ATVs, etc., as transport to, from, and on the emitter or training sites.
  - Dismounted movement. Walking/running associated with several troops in formation or out of formation across land areas from one location to another.
- UoEX. Utilization of munitions and/or equipment in support of training activities. Overall, use of munitions has the potential for chemical residue to interact with the environment. For purposes of analysis UoEX has been categorized further based on the unique potential interaction:
  - Blanks/ground burst simulators (GBSs). Blanks and GBSs are noise generators and, therefore, have been categorized separately from other expendables.
  - Smoke grenades. The main aspect of smoke grenade use is potential for fire hazard; GBSs are also a potential fire hazard.
  - Other/equipment. Includes use of fuel during refueling operations and typically nonhazardous items such as simulated munitions (consisting of plastic pellets or paintballs, which produce little or no noise and have no fire hazard), generators (includes emitter generators), tents, AD bundles, etc.
- Aircraft operations. Use of fixed-wing and/or rotary-wing aircraft as part of a training activity.

- Amphibious Operations. Activities in which the main goal is to interact with, and conduct training within, water resources (boating, shoreline interactions, etc.).
- Electromagnetic radiation (EMR). Use of radar emitters. EMR is categorized separately because it is unique to radar emitter use and has safety implications not related to other effector categories.
- Utilities. Associated with radar emitter use and the use of hardened camp sites. Similar to EMR, it is categorized separately because the impacts associated with use of utilities are not relative to other effector categories.

[Table 3-1](#) cross-references Proposed Action and Subalternative 1 components with their respective effectors:

**Table 3-1. Proposed Action/Subalternative 1 Component Effectors**

Proposed Action Component	Component Effector												
	Land Disturbance				Ground Movement		Expendables			A/C Ops	Amph Ops	EMR	Ut.
	LD	PI	C	ISD	WV	DM	Blanks/GBS	Smoke Grenades	O/Eq.				
Emitter Sites	•			•	•							•	•
LZs/DZs				•									
Use of Expendables							•	•	•				
Low-Level Helicopter Insertions/Extractions				•	•		•	•	•	•			
Temporary Combat Support Areas		•		•	•		•	•	•				
Airdrops				•	•		•	•	•	•			
Air/Land Vertical Lift				•	•		•	•	•	•			
Cross-Country Dismounted Movements		•		•		•	•	•	•				
Roadway Vehicle Use				•	•		•	•					
Blackout Driving				•	•								
Emplacement of Obstacles		•		•	•								
Bivouacking/Assembly Areas		•		•	•		•	•	•				
Communication and Surveillance Operations		•		•	•			•	•				
Amphibious Operations		•		•	•	•		•			•		
Natural Resource Consumption		•	•	•	•	•							
Overwater Hoist Operations					•	•				•	•		

**Table 3–1. Proposed Action/Subalternative 1 Component Effectors, Cont'd**

Proposed Action Component	Component Effector												
	Land Disturbance				Ground Movement		Expendables			A/C Ops	Amph Ops	EMR	Ut.
	LD	PI	C	ISD	WV	DM	Blanks/GBS	Smoke Grenades	O/Eq.				
Opposing Forces Vehicle Operations				•	•	•	•	•	•	•			
Hardened Camp Site Use		•	•	•	•	•	•	•	•				•

A/C = aircraft; Amph = amphibious; C = consumption of natural resources; DM = dismounted maneuvers; DZ = drop zone; EMR = electromagnetic radiation; ISD = incidental surface disturbance; LD = land development; LZ = landing zone; O/Eq. = other/equipment; Ops = operations; PI = point impacts; Ut. = utilities; WV = wheeled vehicles

After effectors associated with each training activity were identified, potential receptors were determined based on the scope of each Proposed Action component. [Table 3-2](#) summarizes the resource areas potentially affected by the effectors given in [Table 3-1](#). Details on how this summary table was derived are provided in the respective resource-specific sections of this chapter (Sections [3.2](#) through [3.13](#)).

**Table 3-2. Proposed Action Affected Receptors**

Effectors	Resource Areas Potentially Affected by Effectors											
	Airspace	Noise	Safety	Air Quality	Earth Resources	Water Resources	Biological Resources	Cultural Resources	Land Use	Socioeconomics/ Environmental Justice	Hazardous/Solid Materials & Waste	Infrastructure
Land Disturbance												
Land development		●	●	●	●	●	●	●	●		●	●
Point impact					●	●	●	●				
Incidental surface disturbance					●	●	●	●				
Consumption						●	●					
Ground Movement												
Wheeled vehicles		●	●	●	●	●	●	●	●	●	●	●
Dismounted movement					●	●	●	●	●	●	●	
Use of Expendables/Equipment												
Blanks/GBS		●	●	●	●	●	●		●	●	●	
Smoke grenades			●	●	●	●	●		●	●	●	
Other/equipment		●	●	●	●	●	●		●	●	●	
Aircraft Operations	●	●	●	●	●		●	●	●	●	●	
Amphibious Operations		●	●	●	●	●	●	●	●	●	●	
Electromagnetic Radiation			●				●		●	●		
Utilities												●

GBS = ground burst simulator

**Table 3-3. Subalternative 1 Affected Receptors**

Effectors	Resource Areas Potentially Affected by Effectors											
	Airspace	Noise	Safety	Air Quality	Earth Resources	Water Resources	Biological Resources	Cultural Resources	Land Use	Socioeconomics/ Environmental Justice	Hazardous/Solid Materials & Waste	Infrastructure
Land Disturbance												
Land development		•	•	•	•	•	•	•	•	•	•	•
Point impact					•	•	•	•				
Incidental surface disturbance					•	•	•	•				
Consumption						•	•					
Ground Movement												
Wheeled vehicles		•	•	•	•	•	•	•	•	•	•	•
Dismounted movement					•	•	•	•	•	•	•	
Use of Expendables/Equipment												
Blanks/GBS		•	•	•	•	•	•		•		•	
Smoke grenades			•	•	•	•	•		•		•	
Other/equipment		•	•	•	•	•	•		•		•	
Aircraft Operations	•	•	•	•	•		•	•	•	•	•	
Amphibious Operations		•	•	•	•	•	•	•	•		•	
Electromagnetic Radiation			•				•		•	•		
Utilities												•

GBS = ground burst simulator

Based on the information in [Table 3-2](#), both emitters and training activities were generally analyzed to determine the potential for adverse impacts and to determine issues to be carried forward for site-specific analysis. This general approach was utilized because, while the locations of activities may differ (e.g., BRSF, THSF), the activities would be the same and the impacts would generally be the same. Only the exact resources affected would differ.

For example, it is known, generally, that CCDM results in trampling of vegetation due to troops traversing the ground surface. It is also known that, generally, impacts may be adverse if troop units are large in size, movements are concentrated, and activities occur within or near sensitive habitats. The general analysis in this chapter focuses on identifying these potential issues, then conducting location-specific analysis, as detailed in subsequent chapters, to determine the degree of impact to location-specific resources from the Proposed Action/Subalternative 1 components and associated effectors. This is accomplished by evaluating *significance* of the impact.

NEPA implementing regulations at 40 CFR Part 1502.1 (Purpose) require full and fair discussion of significant environmental impacts; furthermore, 40 CFR 1502.16 (Environmental Consequences) requires a discussion of direct/indirect impacts and their significance. The CEQ, in 40 CFR Part 1508.27, defines “significant” as consideration of both context and intensity of the impact.

For purposes of this EIS, the attributes of the impact in terms of type, context, intensity, and duration were considered to determine the level of impact and whether it may be considered significant. [Table 3-4](#) summarizes the impact attributes utilized in environmental analyses discussed throughout this EIS. Each attribute is further defined with respect to resource categories in Sections [3.2](#) through [3.13](#).

**Table 3-4. Impact Attributes**

Type of Impact	Context	Intensity		Duration
-Direct -Indirect -Cumulative	-Regional or Population Level -Localized	-High -Medium -Low -Neutral	-Beneficial -Adverse	-Long-term -Medium-term -Short-term

As discussed in Chapter 2, all training activities at the state forests would be conducted, as applicable, per the requirements of EAFBI 13-212 (Chapter 7, Environmental Management), in accordance with the respective state forest management plans, and the terms and conditions identified in the *Eglin AFB Interstitial Area Biological Assessment*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the *Riverine/Estuarine Biological Assessment*, as appropriate.

This EIS relies heavily on both the analyses and the resultant operational constraints imposed on the training activities within the aforementioned documents, because not only are the activities proposed under the Proposed Action exactly the same as those currently occurring on the Eglin Range, but the natural resources present at both BRSF and THSF are similar to those on the Eglin Range (e.g., red-cockaded woodpeckers, wetlands, stream banks). These documents detail previous analyses of these activities at Eglin AFB, and they provide an excellent basis for understanding the requirements (i.e., General Operational Constraints) for implementing the Proposed Action/Subalternative 1 and making impact determinations for the proposed training locations. As a result, there are no highly uncertain, unique, or unknown risks associated with the Proposed Action or Subalternative 1. Consequently, these documents and previous analyses are incorporated by reference as appropriate to reduce paperwork and extraneous background data in this report (per 40 CFR 1502.1, 40 CFR 1502.21).

Additionally, determination of potentially impacted resources includes the assumption that all previously identified General Operational Constraints, as listed in Section [2.5](#), are inherent to the Proposed Action. As an example, General Operational Constraint 5(x) requires all vehicles to remain on designated roads. Therefore, impacts to various resources account for this constraint, and analyses were limited only to potential impacts associated with road use of vehicles.

## 3.2 AIRSPACE MANAGEMENT AND USE

Within the context of this EIS, the term “airspace management and use” refers to the continued safe and efficient flying operations in the airspace above BRSF and THSF. Potential “receptors” of airspace management impacts could include ongoing aircraft operations, as well as agencies responsible for scheduling and control of the local airspace.



### 3.2.1 Impact Assessment Methodology

The impact assessment for airspace management and use evaluates the potential impacts of the Proposed Action and Subalternative 1 on airspace users and managers. Impacts are evaluated according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

#### 3.2.1.1 Regulatory Drivers

Airspace management is defined as the direction, control, and handling of flight operations in the navigable airspace. Navigable airspace is airspace above the minimum altitudes of flight prescribed by regulations under USC Title 49, Subtitle VII, Part A. Congress has charged the Federal Aviation Administration (FAA) with responsibility for developing plans and policy for use of the navigable airspace in the U.S. and its territories to ensure the safety of aircraft and its efficient use (49 USC § 40103(b); FAA Job Order (JO) 7400.2G).

Airspace management considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. The FAA has defined several airspace categories to accommodate varying types and intensities of flight activity. Controlled airspace, airspace of defined dimensions within which air traffic control (ATC) service is provided, is categorized into five separate classes, Classes A through E. Each class has its own set of rules regarding how operations are to be conducted. Uncontrolled airspace is designated as Class G airspace; it exists in volumes of airspace not otherwise designated. ATC services for aircraft en route are provided by air route traffic control centers (ARTCCs). Victor Routes are federally designated airways that act like “highways in the sky” and are commonly used in routing aircraft over long distances. ATC towers and traffic control (TRACON) or radar approach control (RAPCON) facilities manage descending aircraft operating in their respective terminal areas.

The FAA has designated certain volumes of airspace as SUA in accordance with FAA Order JO 7400.8. RAs are a type of SUA in which flight of nonparticipating aircraft is subject to regulatory restrictions due to hazards such as ongoing aerial gunnery or guided missile testing. Most RAs may be released by the managing agency for use by nonparticipating aircraft when not active. MOAs are a type of SUA established to separate certain military training activities from nonparticipating traffic operating under instrument flight rules (IFRs) (i.e., flight procedures that must be used when weather visibility minimums are not met). Aircraft operating under IFRs may be routed through an MOA if ATC can provide guaranteed separation from military training. Nonparticipating aircraft operating under visual flight rules (VFRs) (i.e., procedures used when visibility minimums are met) are encouraged to exercise extreme caution when transiting an active MOA. Alert areas are designated to make nonparticipating pilots aware of a high volume of pilot training operations, or an unusual type of aeronautical activity in the area. Pilots are advised to be particularly alert when flying in these areas. Military training routes (i.e., MTRs) are designated corridors in which low-altitude, high-speed military aircraft operations may be conducted. Routes designated as “instrument routes” (IRs) are flown under IFRs.

Military airspace is managed in accordance with AFI 13-212 and Eglin AFB Instruction 13-212. Compliance with applicable regulations ensures separation of aircraft while conducting combat-realistic training maneuvers.

### 3.2.1.2 Assessment Method

The Proposed Action and Subalternative 1 were considered in the context of existing regulations and procedures for airspace management. Intensity of impacts was assessed considering the level of effort involved in scheduling and controlling the proposed number of training events, as well as the potential for delays to ongoing flying operations as a result of proposed training. The duration of training events was one factor in determining expected airspace management issues. [Table 3-5](#) defines how the impact attributes of context, intensity and duration are applied to airspace management analyses.

**Table 3-5. Definitions of Impact Attributes for Airspace Management**

Attribute	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Contexts Analyzed		
Regulatory	Existing airspace management regulations and processes.	
Regional	Current regional airspace management situation including military training and civilian air traffic.	
Intensity (can be either adverse or beneficial)		
High Mitigations required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure/impact. Unavoidable adverse effects may not be recoverable.	Substantive improvement or decline in scheduling/coordination processes within the regulatory context or within identified regional airspace. May require overhaul of existing or development of new scheduling/coordination processes to accommodate the change.	Substantively improved or degraded operational efficiency within identified regulatory or regional airspace context. May result in substantial reduction or increase in flight delays.
	Can be associated with substantive decrease/increase in flight operations resulting in comparable improved or degraded airspace availability, establishment of new SUA, or elimination of existing SUA.	
Medium Mitigations may be required to avoid adverse impacts, depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate improvement or decline in scheduling/coordination processes within the regulatory context or within identified regional airspace. Impacts can typically be handled through existing scheduling/coordination processes with some changes required.	Moderate improved or degraded operational efficiency within identified regulatory or regional airspace context. May result in noticeable reduction or increase in flight delays.
	Can be associated with a moderate decrease/increase in flight operations resulting in comparable improved or degraded airspace availability or modification of existing SUA. No new SUA would be required.	
Low No mitigations required. Adverse impacts are avoidable.	Minimal change to scheduling/coordination processes within the regulatory context or within identified regional airspace. No noticeable impact to existing scheduling/coordination processes.	Slightly improved or degraded operational efficiency within identified regulatory or regional airspace context. No noticeable reduction or increase in flight delays.
	Can be associated with a decrease/increase in flight operations that are comparable to existing operations and have no noticeable impact on airspace availability. Would not require modification of existing SUA or new SUA.	
Neutral	Overall, no impact to existing scheduling/coordination process.	No impact to efficiency of operations on local or regional scale.
	No decrease/increase in flight operations and no impact on airspace availability. Would not require modification of existing SUA or new SUA.	

**Table 3-5. Definitions of Impact Attributes for Airspace Management, Cont'd**

Attribute	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

BMP = best management practice; SUA = special use airspace

### 3.2.1.3 Impact Levels

The level of impact associated with airspace and potential significance to airspace management and use is determined by considering how Proposed Action/Subalternative 1 effectors could interact with airspace in terms of context, intensity, and duration as described in [Table 3-5](#). [Table 3-6](#) explains the impact level categories for airspace management analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

### 3.2.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter [2](#), emitter site use would not be expected to result in interactions with airspace management. The emitters would not be expected to have any effect on the tempo of military training operations or procedures used to manage current military and civilian operations. As a result, this issue area has not been carried forward for site-specific analysis in Chapter [4](#).

**Table 3-6. Impact Level Categories for Airspace Management**

Level of Impact	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Adverse	Adverse airspace impacts may result in scheduling and coordination conflicts and issues, the level of impact directly related to the impact attributes described in <a href="#">Table 3-5</a> . Adverse impacts may be perceived as significant under medium-to-high intensity scenarios at any duration if scheduling and coordination cannot be accomplished using any existing or feasibly implemented system. Uncoordinated activities would be unsafe for Department of Defense personnel or civilians, and new special use airspace would be required and result in major overhaul of ongoing flight procedures. Insignificant impacts would likely occur under medium-to-low intensity scenarios of short duration where existing scheduling process can be adjusted or new process implemented to facilitate de-confliction of existing and proposed operations. Proposed scheduling processes in combination with existing scheduling processes would allow continued safe and efficient operations.	Adverse impacts may result in a decline in the efficiency of ongoing operations, the level of impact directly related to the impact attributes described in <a href="#">Table 3-5</a> . Significant impacts may result in frequent, substantial delays of ongoing operations on a local or regional scale. Insignificant airspace impacts may result in delays of ongoing operations but would not be common.
Neutral / no effect	Under a neutral or no-effect scenario, existing scheduling processes can handle proposed operations tempos and no coordination is required.	Results in little or no impact to efficiency of operations on local or regional scale.

### 3.2.3 General Training Activity Impact Assessment

[Table 3-7](#) identifies potential interactions between the Proposed Action or Subalternative 1 effectors and airspace management receptors. Based on the scope of action described in Chapter [2](#), activities involving land disturbance, ground movement, UoEX, Amphibious Operations, and utilities would not result in potential interactions or

impacts to airspace management; these issue areas are identified as “green” in the table below and are not carried forward for site-specific analyses in Chapters 5 (BRSF) and 6 (THSF). Aircraft operations have the potential for adverse impacts and are, therefore, carried forward for site-specific analyses in Chapters 5 and 6. These areas are shaded yellow in the table below. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations; these activities are not carried forward for detailed analysis in Chapters 5 and 6.

### 3.2.4 Proposed Resource-Specific Mitigations

To ensure that FFS operations would not be negatively impacted by GLI training, the Air Force would coordinate with FFS POCs prior to any mission. This coordination would minimize identified impacts from adverse (yellow) to neutral (green) over the mid- to long term.

**Table 3-7. Receptor and Effector Interactions for Airspace Management**

Effector	Airspace Resource Area Potentially Affected (Receptor)	
	Scheduling/Coordination Processes	Efficiency of Ongoing Operations
Land Disturbance	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with airspace management. <b>Subalternative 1:</b> Same as Proposed Action.	
Land development		
Point impacts		
Incidental surface disturbance		
Consumption		
Ground Movement	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with airspace management. <b>Subalternative 1:</b> Same as Proposed Action.	
Wheeled vehicles		
Dismounted maneuver		
Use of Expendables	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with airspace management. <b>Subalternative 1:</b> Same as Proposed Action.	
Aircraft Operations	<b>Proposed Action:</b> Potential for adverse impacts has been identified. Therefore, this issue area has been carried forward for site-specific analysis. A new coordination process would be implemented between the Air Force and the FFS to ensure that GLI training would not interfere with ongoing FFS operations. Existing scheduling procedures would be followed prior to any use of existing SUA airspace above BRSF or THSF. No new SUA or modifications to existing SUA required. <b>Subalternative 1:</b> Same as Proposed Action.	<b>Proposed Action:</b> This issue area has been carried forward for site-specific analysis. Ability to use BRSF and THSF for training would reduce demand on Eglin Range and its associated SUA. Demand for the Eglin Range training environment is expected to continue to increase in coming years. GLI use of SUA over BRSF and THSF would be minimal and would not be expected to result in scheduling conflicts. With proposed coordination between Air Force and FFS, GLI operations would not interfere with ongoing FFS operations. Increased VFR training operations over BRSF and THSF would not be expected to interfere with other aircraft traffic. <b>Subalternative 1:</b> Same as Proposed Action.
Amphibious Operations	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with airspace management. <b>Subalternative 1:</b> Same as Proposed Action.	
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with airspace management. <b>Subalternative 1:</b> Same as Proposed Action.	

BRSF = Blackwater River State Forest; FFS = Florida Forest Service; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; SUA = special use airspace; THSF = Tate's Hell State Forest; VFR = visual flight rules

## 3.3 NOISE

Within the context of this EIS, the term “noise” is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment.

In effect, the resource discussed here is a quiet or locally appropriate sound environment as experienced by humans in general. This component of noise is referred to as a “receptor.” Additional discussion of specific noise impacts on other “receptors” can be found in sections discussing biological resources (noise impacts on wildlife), cultural resources (noise impacts on physical objects and experiential resources), land use (noise impacts on existing land uses), and socioeconomic/environmental justice (noise impacts on the economy and specific subsets of the population).

Sound levels are recorded on a logarithmic decibel (dB) scale, reflecting the relative way in which the ear perceives differences in sound energy levels. The threshold of hearing is 0 dB, typical conversations are held at about 60 dB, and the threshold of discomfort is 120 dB. Under normal conditions, a person with healthy hearing can detect a 3-dB change in sound level.

Sound measurement may be further refined through the use of frequency “weighting.” In A-weighted measurements, sounds at frequencies heard best by the human ear are emphasized. In the case of sonic booms, blast noise, and other impulsive booming noises, sound is felt as well as heard. With these types of noise, overpressure may be considered more annoying than the sound itself. For this reason, impulsive sounds are measured using C-weighting, which does not attenuate the lower frequencies to the extent that A-weighting does. Sounds measured in these ways are quantified as A-weighted decibels (dBA) or C-weighted decibels (dBC). Unless otherwise noted, all sound levels referenced in this document are A-weighted.

The sound exposure level (SEL) is a noise descriptor that accounts for both the intensity and duration of an individual noise event. The SEL provides a measure of the total sound exposure for the entire event as if it was compressed into a single second and is useful for predicting certain outcomes, such as awakenings from sleep.

For longer periods of time, total sound is represented by the equivalent continuous sound pressure level ( $L_{eq}$ ).  $L_{eq}$  is the average sound level over some time period, with the averaging being done on the same energy basis as used for SEL. Just as SEL has proven to be a good measure of the noise impact of a single event,  $L_{eq}$  has been established to be a good measure of the impact of a series of events during a given time period. Also, while  $L_{eq}$  is defined as an average, it is effectively a sum over that time period and is, thus, a measure of the cumulative impact of noise.

Day-night average sound level (DNL) is a noise descriptor that averages A-weighted sound levels over a 24-hour period, with an additional 10-dB penalty added to noise events occurring between 10:00 PM and 7:00 AM. The 10-dB penalty compensates for lower background noise levels at night, and the increased potential for annoyance associated with late-night noise events. The onset-rate adjusted monthly day-night average sound level further adjusts DNL. This metric adds a penalty of up to 11 dB to account for the potential startle effects caused by low-altitude, high-speed aircraft and is calculated monthly to account for the high degree of daily variability in the tempo of airspace operations during training.

Because munitions noise levels are so strongly influenced by meteorological conditions (e.g., winds), the peak noise level reaching a particular location after a particular noise event may vary significantly. The metric “peak noise exceeded by 15 percent of firing events” (PK 15[met]) accounts for weather-influenced statistical variation in received



single-event peak noise levels. PK(met) is the peak noise level, without frequency weighting, expected to be exceeded by 15 percent of all firing events.

### 3.3.1 Impact Assessment Methodology

The impact assessment for noise evaluates the potential impacts of the Proposed Action and Subalternative 1 to the existing sound environment and receptors in that environment. Impacts are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts. The “intensity” of noise impacts is affected by characteristics of the noise (e.g., spectral content, frequency of occurrence, and time of day) as well as characteristics of the listener and the activity being conducted when the noise occurs. Noise impact analysis addresses the potential for the Proposed Action and Subalternative 1 to result in impacts to public safety and human health as well as the environment from both auditory and nonauditory noise impacts, annoyance, and land use compatibility. The relationships between noise and biological resources and land use compatibility are addressed in the Biological Resources and Land Use sections of this EIS, respectively, using the results of the noise analysis.

#### 3.3.1.1 Regulatory Drivers

Since legal limits on allowable noise levels could, in some cases, reduce the combat effectiveness of military equipment, such equipment has been exempted from federal regulations that impose noise limitations. However, several federal regulations, policies, and studies inform decision-making with regard to noise. DoD recognizes that noise-sensitive land uses are not compatible with elevated military training noise levels and has adopted guidelines for determining land use compatibility near military installations. According to land use guidelines in DoD Instruction 4165.57, *Air Installation Compatible Use Zones* (AICUZ), residential and other noise-sensitive land uses are not considered compatible with noise levels greater than 65 dB DNL, unless special structural noise attenuation measures are installed. Although the Proposed Action/Subalternative 1 would not occur near a military installation, noise levels exceeding these established guidelines are less likely to be considered acceptable. The United States Environmental Protection Agency (USEPA) has indicated that minimal impacts to human health and welfare would occur at levels below 55 dB DNL (USEPA, 1974).

The U.S. Army is the DoD service with the lead role in setting munitions noise policy and has established land use recommendations based on munitions noise levels near training ranges. Army Regulation 200-1 discourages noise-sensitive land uses, such as residential, where small arms firing noise exceeds 87 dB peak and strongly discourages such land uses where levels exceed the 104-dB peak level only 15 percent of the time (PK 15[met]). The same regulation discourages noise-sensitive land uses, such as residential, where large-arms noise levels exceed 115 dB PK 15(met) and strongly discourages such land uses where large arms noise exceeds 130 dB PK 15(met).

Several Florida Statutes establish limitations on noise generated by ground vehicles and boats. Florida Statutes 316.272 and 316.293 require vehicles to be equipped with an exhaust system in good working order including muffler, manifold pipe, and tailpiping to prevent excessive noise. Under these regulations, vehicles exceeding a gross

combination weight rating of 10,000 pounds that were built after 1975 should not exceed 90 dB at a distance of 50 feet while operating at greater than 35 miles per hour (mph). Motorcycles built after 1979 should not exceed 82 dBA at a distance of 50 feet while operating at 35 mph. Florida Statute 261.20 requires exhaust noise for all off-highway vehicles (OHVs) manufactured after 1986 to be less than 96 dBA at a distance of 20 inches. Florida Statute 327.65 addresses noise exposure to humans from passing boats. It states that to prevent potential annoyance, no vessel should exceed a maximum sound level of 90 dBA at a distance of 50 feet.

Certain counties within the ROI have enacted ordinances for the abatement of excessive and unnecessary noise. Okaloosa County, for example, has established maximum sustained noise levels at residential property lines of 60 dBA during 7:00 AM to 10:00 PM and 55 dBA between 10:00 PM and 7:00 AM. Noise generated by aircraft operations, vehicles in compliance with Florida noise statutes, authorized target shooting, and law enforcement training are exempted from these limitations. Santa Rosa, Liberty, and Franklin Counties' ordinances do not contain limitations on noise generated by proposed GLI training or emitter operations.

### **3.3.1.2 Assessment Method**

Aircraft noise levels were calculated using the environmental noise mapping software NOISEMAP, version 7.2, and the Rotorcraft Noise Model (RNM). Munitions noise levels were calculated using the Small Arms Range Noise Assessment Model (SARNAM), version 2.6, and Blast Noise Version 2 Noise Impact Software (BNOISE2™). GLI training is intended to allow maximum flexibility in mission planning, and several types of aircraft and ground vehicles could be used by various units. For training events that could use several aircraft and ground vehicle types, the loudest was selected to represent all. Surrogate noise sources were selected for aircraft types for which noise levels are not included in the standard DoD source noise databases. Surrogate noise source selection details are provided in sections discussing each type of training event.

As described in Chapter 2, training locations (e.g., LZ/DZ, OHO location) would be selected that meet the physical requirements for training and at which training could be conducted without causing significant noise impacts. For this EIS, noise levels were calculated at various distances from a nominal training location, to determine the distance at which noise drops below impact levels. During the training site selection process, locations closer than these minimum distances to known noise-sensitive locations would not be considered.

In addition to considering the location of a training site, approach/departure corridors would be established for landing and drop zones. Distances from a nominal routing corridor and maneuver area at which noise would drop below impact levels are presented. This process of establishing approach/departure corridors is referred to as "aeromapping." The site selection and aeromapping process would be followed whenever a new training location (e.g., LZ) is required. As described in Chapter 2, training locations that are ideal for training initially become less desirable over time due to vegetation growth and other factors, and so new training locations would occasionally be required. In addition to close examination of the areas around proposed new training locations, the areas surrounding existing training areas would be surveyed every two years to ensure that no new noise-sensitive land uses have been established.

One of the primary benefits of GLI training is that it provides training flexibility so as to avoid scripted, nonrealistic training experiences. In a flexible training environment, many details, such as aircraft ground tracks, would be variable from one mission to the next. In modeling noise, threshold noise level distances were calculated based on an extremely conservative set of assumptions. Noise thresholds are based on a high estimate of operations under each applicable operational scenario. The actual number of operations at each training location would be substantially less, given the relative infrequency of training over the long term, resulting in lower noise levels than those estimated.

[Table 3-8](#) defines how the impact attributes of context, intensity, and duration are applied to noise analyses.

**Table 3-8. Definitions of Impact Attributes for Noise Resource Categories**

Attribute	Transient Users	Permanent Residents
Contexts Analyzed		
Distributed	Impacts are distributed throughout the entire state forest.	
Localized	Impacts are localized within the area surrounding the training location.	
Intensity (can be either adverse or beneficial)		
High Mitigations required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure/impact. Unavoidable adverse effects may not be recoverable.	Substantive change in the noise environment that relatively improves the user experience or creates annoyance/impacts such that use is permanently or frequently incompatible.	Substantive change in the noise environment that relatively improves quality of life or creates annoyance/impacts such that residential use is incompatible.
	Examples include discontinuation of baseline aircraft operations or munitions training or creation of low-level airspace or munitions training areas where there were none previously. The USEPA predicts no impacts to human health and welfare would occur at 55 dB DNL, while DoD land use guidelines identify 65 dB DNL for aircraft noise, 87 dB PK 15(met) for small arms noise, and 62 dB CDNL for explosives noise. Although DNL does not describe noise level at any given time, a high DNL indicates that noise levels would often be high enough to interfere with activities and cause annoyance.	
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate change in the noise environment that relatively improves the user experience or creates annoyance/impacts such that use is occasionally incompatible.	Moderate change in the noise environment that relatively improves quality of life or occasionally creates short-term annoyance.
	Examples include reduction or increase in baseline aircraft operations or munitions training.	
Low No mitigations required. Adverse impacts are avoidable.	Slight change in the noise environment that has little beneficial or adverse impact on the user experience and does not result in compatibility issues.	Slight change in the noise environment that has little beneficial or adverse impact on residents and does not result in annoyance.
Neutral	No noticeable change in the baseline noise environment.	
Duration		
Long term	Effect would be recurring for more than a year.	
Medium term	Effect would be recurring for a few months to a year.	
Short term	Effect would likely last for a few hours.	

BMP = best management practice; CDNL = C-weighted day-night level; dB = decibels; DoD = Department of Defense; DNL = day-night level; PK 15 (met) = peak level exceeded only 15 percent of the time; USEPA = U.S. Environmental Protection Agency

### 3.3.1.3 Impact Levels

The level of impact associated with noise and the impact's potential significance is determined by considering how Proposed Action/Subalternative 1 effectors could

interact with the existing baseline noise environment and noise resource categories (e.g., context) in terms of intensity (e.g., Proposed Action/Subalternative 1 noise levels), and duration as described in [Table 3-8](#). [Table 3-9](#) explains the levels of impact for the noise resource categories analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-9. Impact Level Categories for Noise Resources**

Level of Impact	Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Adverse	Adverse noise impacts may result in annoyance, incompatible land uses, or safety issues, the level of impact directly related to the impact attributes described in <a href="#">Table 3-8</a> . Adverse impacts may be perceived as significant under medium-to-high intensity scenarios at any duration if noise levels exceed USEPA and DoD guidelines and/or result in reduced public safety or incompatible land uses. Insignificant noise impacts would likely occur under medium-to-low intensity scenarios of short duration resulting in annoyance to some persons in the ROI at certain times; however, noise impacts would be less frequent and/or less intense in comparison to USEPA and DoD guidelines.
Neutral/no effect	Noise levels would be reduced relative to baseline conditions, or noise impacts would be minor enough to be considered negligible by most users. Noise from training operations may be heard but not for an extended duration. Noise does not disrupt use of the forest (e.g., camping, hunting). Noise events would be infrequent and/or not intense, such that people in the ROI rarely take notice.

DoD = Department of Defense; ROI = region of influence; USEPA = United States Environmental Protection Agency

### 3.3.2 General Emitter Activity Impact Assessment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Proposed emitter site locations are shown in [Figure 2-5](#). The emitters would be located in rural areas, characterized by low-density residential development and agriculture as primary land uses. USEPA has stated 44 decibels (dB) and 51 dB as typical DNL noise levels at a farm area and a low-density residential area, respectively (USEPA, 1974). In a study of four Department of Interior Conservation areas in Florida, existing ambient sound levels, excluding aircraft, ranged from 31.2 dB  $L_{eq}$  to 64 dB  $L_{eq}$ , with the majority of sound levels being between 45 dB  $L_{eq}$  and 55 dB  $L_{eq}$  (Fleming et al, 1999). Based on measured noise levels in similar settings, ambient noise levels at the proposed emitter locations are assumed to be approximately 45 dB DNL, although it is recognized that average noise levels in certain very remote areas within the ROI are lower.

Minor improvements for security/access would be required at FWC-1, FWC-2, FFS-3, FFS-4, and FFS-8. Construction of these improvements would result in localized, temporary increases in noise that could be noticed by nearby residents. However, noise generated by construction of fences and gates would be temporary in nature, and the Air Force does not expect these activities to result in adverse noise impacts. FWC-1 and FWC-2 would be replaced by FWC-3 under Subalternative 1.

Site FWC-2 does not have a connection to electrical utilities available on-site, so a generator would be used to power the emitter. The generator used to supply power at FWC-2 would be an industry-standard diesel generator enclosed in housing with vertical exhaust pipe. The nearest residence to FWC-2 is more than 2,000 feet away. At this distance, a typical generator would create noise at about 49 dB while running (Federal Highway Administration [FHWA], 2006). Operation of the generator would be in

compliance with all applicable regulations relating to noise. Generator noise would be localized, low intensity, and brief. While it may be audible when ambient noise levels are low, the Air Force does not expect the noise to be disruptive at any noise-sensitive locations. Emitter locations with electrical utility connections available would generate minimal noise while operating. FWC-2 would not be used under Subalternative 1.

Therefore, based on the context and intensity of identified impacts, the Air Force has not identified the potential for adverse impacts to public health or safety or the natural environment from noise or violations of federal, state, or local regulations associated with emitter activity and this resource has not been carried forward for site-specific analysis in Chapter [4](#).

### 3.3.3 General Training Activity Impact Assessment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Both state forests are used for recreational activities, such as camping, hiking, hunting, fishing, and horseback riding, as well as for commercial activities such as logging. Ground vehicles, including passenger vehicles and heavy trucks, use the roads and trails at BRSF and THSF. Only electric or hand-powered boats are allowed on the recreational lakes at BRSF, but gas-powered motor boats are used in other bodies of water at both forests. Privately held parcels of land in the forests are used for agriculture and low-density residential development. USEPA has stated 44 dB and 51 dB as typical DNL noise levels at a farm area and a low-density residential area, respectively (USEPA, 1974). As noted in Section 3.3.2, measured noise levels in areas similar to the two state forests vary widely between specific places. Based on noise levels measured in similar settings, ambient noise levels (i.e., while military training is not under way) at the forests are assumed to be 45 dB DNL, although it is recognized that average noise levels in certain very remote areas within the ROI are lower.

Social surveys suggest that at 65 dB day-night average sound level for subsonic noise ( $DNL_{mr}$ ), about 12 percent of the population can be expected to become highly annoyed by the noise (DNWG 2009; Wyle 2009).

GLI training would be conducted in preparation for covert missions where the chances of survival and success are maximized by avoiding detection. Training would be as similar to real-world missions as possible. The following characteristics of the proposed missions are an important factor in determining the patterns of noise and noise impacts.

- Avoid inhabited areas. Avoidance of inhabited areas is in keeping with a “good neighbor” policy and also provides realistic training for avoiding detection during real-world contingency operations.
- Use cover of darkness. Approximately 50 percent of the proposed training missions would be conducted after dark. Although late-night missions are avoided to the extent practicable, an estimated 20 percent of total missions would take place at least partially after 10:00 PM and before 7:00 AM. As mentioned in Section [3.3.1](#), noise events during this time period are assessed a



10-dB penalty in calculating the DNL metric to account for additional annoyance caused by late-night noise. During hunting season, night operations would only occur two hours after sunset to two hours before sunrise.

- Aircraft use of low altitudes. Low-altitude flight minimizes the chances of detection. Lower-altitude flights are louder for people directly overflown, but noise levels drop off relatively rapidly with lateral distance from the aircraft.

### Aircraft Operations

Appendix H, Section H.3.1.5 provides a detailed description of assumptions used in noise modeling, with operational numbers based on the details provided in Chapter 2. LLHI/E, AD, A/LVL, and OHO would involve aircraft maneuvering to designated locations followed by training and then departure. Aircraft maneuvering to or from designated training locations would operate at low altitudes most of the time and would conduct approximately 50 percent of operations after dark for reasons discussed above; the percent of total operations that would occur at least partially between 10:00 PM and 7:00 AM would vary by season. Aircraft operations in noncongested areas and away from known persons, structures, or vehicles are permitted below 500 feet AGL, in accordance with FAA and Air Force regulations (14 CFR Part 91, 91.119, AFI 13-201 v3). However, it is not possible to know at any given time where all of the users of each forest are located. To minimize the likelihood of low-altitude overflights, an aircraft conducting GLI training would not operate below 500 feet AGL except while descending to or climbing away from designated training locations (e.g., LZs/DZs, OHO locations). While operating at 500 feet AGL, aircraft that would commonly be used in GLI training would typically generate noise levels less than 95 dB SEL, even if they were to directly overfly a listener ([Table 3-10](#)). An SEL of 95 dB has been adopted as a voluntary noise exposure limit for aircraft operating on Eglin Range (Air Force, 2004). Direct overflights by aircraft maneuvering to or from designated training locations above 500 feet AGL would be infrequent because flight tracks would vary from one mission to the next.

**Table 3-10. SEL Under the Flight Track for Representative Aircraft Types**

Aircraft Category	Aircraft Type	SEL in dB <sup>2</sup>			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types to be used in GLI training	2-engine, propeller-driven <sup>1</sup>	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
	T-6	98	93	73	100% engine torque	160

AGL = above ground level; CTIT = turbine inlet temperature in degrees Celsius; dB = decibels; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative; hp = horsepower; kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; RPM = revolutions per minute; SEL = sound exposure level

1. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

2. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

Aircraft types other than those listed in [Table 3-10](#) would also participate in training exercises but less frequently. These other aircraft would have similar missions and generate similar noise levels to those listed in [Table 3-10](#).

Aircraft engaged in GLI training would often fly in formations of two or more aircraft. While operating at higher altitudes (e.g., 1,000 feet AGL and above), aircraft flying in formation are more likely to be heard as a single noise source. If a sound's intensity is doubled, such as would occur if two aircraft were flying very close to each other at a relatively high altitude, the overall sound level increases by 3 dB regardless of the initial sound level. For example, two C-130 aircraft flying directly overhead at 1,000 AGL would generate about 93 dB SEL. Formations are typically spaced such that, while flying at low-altitudes, the overflight of each aircraft in the formation is experienced by a person on the ground as an individual noise event separated by a brief interval from the overflight of other aircraft in the formation.

Assuming each mission spends an hour maneuvering to and from the training location and that flight tracks are distributed evenly across the forest area over time, the noise level generated by aircraft maneuvering to and from training areas would be below 45 dB DNL<sub>mr</sub> under the Proposed Action and Subalternative 1. C-130, C-23, and H-47 aircraft were used as surrogate noise sources for aircraft traveling to and from AD, fixed-wing A/LVL, and LZ training events, respectively.

As described in Section [2.3.2.1](#), LZ/DZs would be established but then replaced as needed when vegetation height or other conditions become less than ideal for training. Therefore, noise impacts were calculated relative to a nominal LZ/DZ without any fixed location.

Under the Proposed Action, there would be about five training events per week on average at each LZ/DZ, including LLHI/E, AD and A/LVL, once GLI training is at full capacity.

Under Subalternative 1, there would be about three training events per week on average at each LZ/DZ including all types of training. Under normal circumstances, training events at LZs/DZs would include one or two aircraft. Approximately 20 percent of training events are expected to occur after 10:00 PM.

Noise levels were calculated for a scenario where eight LZ/DZs exist at any given time and, except for the instances listed below, one-eighth of total training events would be expected occur at each of the LZ/DZs. Blackwater Airfield was analyzed for noise impacts separately from the "standard LZ/DZ" because it would be used for fixed-wing aircraft landings in addition to the other training activities conducted at all LZ/DZs under both the Proposed Action and Subalternative 1.

Under Subalternative 1 only, personnel airdrops would be conducted at BW12 only and equipment/CDS drops would be conducted only at BW6 and BW7. Noise levels were calculated for these LZ/DZs separately under Subalternative 1.

The MV-22 was used as a surrogate aircraft noise source for multiple aircraft types that would conduct LLHI/E and A/LVL operations at the LZ/DZs. C-130 aircraft would be the most common aircraft type conducting AD training at LZs/DZs and was used as the noise surrogate for this type of training. C-17 aircraft would conduct AD training only

two to three days per year. Noise levels reflect a worst-case scenario where all operations are concentrated on a single flight path and hover location. In fact, approaches and departures would be distributed across multiple flight paths, and hover would occur anywhere within the LZ. This distribution would result in lower time-averaged noise levels at any given location than those calculated.

Under the Proposed Action, noise levels greater than 55 dB DNL could occur at up to 2,200 feet laterally from the LZ/DZ. Under a scenario in which all aircraft follow a single flight track both inbound to and outbound from the LZ, noise levels drop below 55 dB DNL at 200 feet laterally from the flight path and at 8,300 measured outward from the LZ (about 1.6 statute miles). At distances farther from the LZ, aircraft are typically at higher altitudes and may also operate in configurations that generate less noise (e.g., the MV-22 operates in relatively quiet aircraft mode until it nears the LZ).

Areas near the LZs potentially exposed to noise levels exceeding 55 dB DNL were delineated using a highly conservative approach. Aside from the restrictions on flight determined through the aeromapping process (see Sections [2.5](#) and [3.3.1.2](#)), pilots could potentially use any flight path when approaching and departing LZs. As a worst-case scenario, it was assumed that every single aircraft inbound to an outbound from the LZ would follow a single flight path. This single flight path was treated as potentially existing anywhere within the 'potential fly zones' identified through aeromapping. A similar assumption was made in relation to hover training in the LZs. Namely, it was assumed that all hover operations would occur at a single location and that location could be anywhere within the LZ. In fact, flight paths and hover locations would vary from one training mission to the next. This distribution of operations across a wide area would mean that individual locations would be directly overflown less frequently and time-averaged noise levels would be lower than 55 dB DNL.

Under Subalternative 1, time-averaged noise levels near the LZs would be only slightly lower than under the Proposed Action. A/LVL training would be the most frequent training type and the dominant contributor to overall noise levels near the LZs. This type of training would occur at the same frequency under the Proposed Action and Subalternative 1.

To avoid excessive annoyance with an extra margin of error, LZ/DZs would be located not less than 2,200 feet laterally from known noise-sensitive locations (e.g., campgrounds, hiking/horseback riding trails, stables, privately owned parcels with residences). For the same reason, approach/departure paths would be located not less than 200 feet laterally from known noise-sensitive locations at distances from the LZ along the flight path of up to 8,300 feet (about 1.6 statute miles).

As mentioned previously, Blackwater Airfield was analyzed for noise impacts separately from the other proposed LZ/DZs. [Table 3-11](#) lists noise levels generated during landings and takeoffs by a C-23 Sherpa, a propeller-driven aircraft typical of the fixed-wing aircraft that would conduct A/LVL at Blackwater Airfield. [Table 3-12](#) lists typical altitudes during approach and departure operations for a standard flight profile of a C-23. During arrival operations, the aircraft is assumed to descend at 300 feet per nautical mile and to reach the runway threshold (i.e., the end of the airstrip) at 50 feet AGL. During approaches, aircraft generally use very low engine power settings, and noise levels are relatively low (see [Table 3-11](#)). Altitudes during departure would

depend on where the aircraft rotates (i.e., becomes airborne). Aircraft typically use full power during departure so that they can climb as quickly as possible and, thus, generate higher noise levels than during approach.

**Table 3-11. SEL Under the Flight Track for Takeoffs and Landings**

Aircraft	SEL in dB <sup>1</sup>			Power	Speed (kts)
	100 feet AGL	500 feet AGL	1,000 feet AGL		
2-engine, propeller-driven <sup>2</sup> takeoff	94	84	79	100% RPM	160
2-engine, propeller-driven landing	90	80	75	30% RPM	160

AGL = above ground level; dB = decibels; hp = horsepower; kts = knots; RPM = revolutions per minute; SEL = sound exposure level

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

**Table 3-12. Typical Altitude at Distances from Blackwater Airfield**

Operation Type	Feet from Blackwater Airfield Threshold (on Approach) or Rotation Point (on Departure)				
	500	1,000	1,500	2,000	2,500
Altitude on approach <sup>1</sup>	75	99	124	149	173
Altitude on departure <sup>2</sup>	51	102	154	205	256

1. Assumes 300 feet descent for each nautical mile traveled horizontally.

2. Assumes standard climb-out profile for surrogate aircraft, the C-23 Sherpa.

Fixed-wing A/LVL training sorties would be conducted at Blackwater Airfield about 12 times per year. Aircraft would typically only make one approach to Blackwater Airfield on any given day. For the purpose of this analysis, the C-23 Sherpa was used a surrogate noise source representing multiple aircraft types because it would be expected to be only slightly louder than the loudest of the training aircraft, based on the horsepower and number of engines with which it is equipped. Selection of a noise surrogate aircraft slightly louder than the training aircraft yields conservative analysis results. All operations were assumed to follow a single flight path, effectively concentrating noise to the greatest extent possible. It was also assumed that runways are used with equal frequency and 20 percent of operations were assumed to occur after 10:00 PM. OHO would take place at surveyed locations in open water up to once per month. Training events could include up to four aircraft, but one or two aircraft per event would be typical. For the purposes of this analysis, it was assumed that all OHO operations would take place at a single location. Because the frequency of OHO operations is low relative to other types of GLI training, time-averaged noise levels generated would be low, dropping to below 55 dB DNL at a distance of approximately 400 feet from a single nominal hover location. However, individual OHO operations could be highly disruptive and annoying to people located nearby. The noise level of a CV-22 hovering at 80 feet AGL drops to about 74 dB across water at a distance of about 2,200 feet. Water absorbs very little sound energy and, therefore, sound waves traveling across water lose less intensity than sound waves traveling across land. To avoid excessive disturbances caused by hovering rotorcraft noise, OHO hover locations

would not be sited less than 2,200 feet (i.e., the same distance applied to LZ/DZs) from known noise-sensitive locations.

### Munitions Use

Under the Proposed Action, approximately 8,000 blank 7.62-millimeter (mm) (M240) and 10,000 5.56-mm (M4) rounds would be fired per training event. In total, 576,000 blank 5.56-mm rounds and 196,200 blank 7.62-mm rounds would be fired annually. At BRSF, noise-generating expendables would only be used at hardened campsites; at THSF noise-generating expendables could be used anywhere outside noise buffers as identified in Section 2.5. Blank rounds do not fire a bullet and are quieter than live rounds. Many of these rounds would be fired indoors, and would generate limited noise outside.

Under Subalternative 1, there would be no noise-generating expendables used at THSF. Approximately 600,000 blank 5.56 mm and 7.62 mm rounds would be fired annually (10,000 rounds per training event) at BRSF hardened camp sites, and all other munitions use would be the same as under the Proposed Action.

As described in Army Regulation 200-1, noise-sensitive land use where small arms noise exceeds 87 dB PK 15(met) is discouraged, and noise-sensitive land uses where small arms noise exceeds 104 dB PK 15(met) is strongly discouraged. [Table 3-13](#) lists distances from the training location at which gunfire noise levels drop below these impact levels. Noise levels were calculated for a position 90 degrees to the right of the line of fire.

**Table 3-13. Munitions Noise Threshold Distances (Feet)**

Munitions Type	Distance in Feet at Which Noise Is Below Peak Noise Level (dB PK 15[met]) <sup>1</sup>	
	87 dB	104 dB
5.56-mm blank	525	176
7.62-mm blank	3,779	851
	Distance in Feet at Which Noise Is Below CDNL <sup>1</sup>	
	62 dB	70 dB
Ground burst simulator <sup>2</sup>	2,539	1,201

CDNL = C-weighted day-night average sound level; dB = decibels; mm = millimeter; N/A = not applicable; PK 15[met] = peak level exceeded only 15 percent of the time

1. Small arms distances interpolated from measured noise levels (Stewart, 2014); BNOISE2™ used to calculate ground burst simulator noise.

2. Ground burst simulator (M115A2) modeled as TNT 0.063 kilograms (0.139 pounds).

Approximately two to five ground-burst simulators would be used during each training event, for a total of 5,172 ground burst simulators used annually. Ground burst simulators were assumed to be used with equal frequency at the former STOP Camp and SRYA. Army Regulation 200-1 discourages noise-sensitive land use where explosives noise exceeds 62 dB CDNL and strongly discourages noise-sensitive land uses where noise from explosives exceeds 70 dB CDNL. [Table 3-13](#) lists the distances from location of detonation at which peak noise levels drop below impact levels.



### Ground Vehicle Operations

Ground vehicle operations would be a central component of Roadway Vehicle Use (i.e., RVU), BD, and OFVO. Ground vehicles would also be used to transport support personnel and equipment to training locations. [Table 3-14](#) lists noise levels for heavy trucks such as a 2.5-ton truck and HMMWVs. Ground vehicle training would make use of a wide variety of vehicles. Smaller vehicles, such as minibikes, would generally be expected to be quieter than HMMWVs or heavy trucks.

**Table 3-14. Ground Vehicle Noise**

Equipment	SEL (in dB) at Distance		
	100 feet	200 feet	300 feet
HMMWV <sup>1</sup>	62	56	50
Heavy truck <sup>1</sup>	76	70	64

dB = decibels; HMMWV = high-mobility multipurpose wheeled vehicle; SEL = sound exposure level

1. Navy, 2003

Ground vehicles using roads and trails on the forests include passenger vehicles as well as heavy trucks used for industrial activities, such as logging. Noise generated by ground vehicle operations conducted as part of GLI training may be annoying to persons in the forests or private inholdings, particularly when it occurs at night, generating impacts that would be considered moderate. Noise impacts would be localized to the area where ground vehicles are operating and would be limited to the duration of the training event.

Under Subalternative 1, Blackout Driving and other activities would not occur, therefore resulting in an associated reduction in potential noise impacts from wheeled vehicle use versus the Proposed Action.

### Amphibious Operations

Amphibious Operations (AO) training events would involve up to six watercraft equipped with engines ranging from 35 to 200 horsepower (hp). When operated at full throttle, outboard engines generate noise that is often considered intrusive. For example, twin 225-hp engines often generate noise louder than 100 dB at 10 feet from the motors (Rudow, 2004). While training for covert missions and operating in relatively confined bodies of water, boats would not be expected to use full throttle often. AOs would be expected to occur only about 10 times per year and would be distributed among several water bodies at each forest. Impacts would be localized to the body of water in which training is taking place and would last only for the duration of the training event. Noise impacts from AOs would be considered moderate in intensity.

Under Subalternative 1 this activity would not occur.

#### 3.3.3.1 General Training Activity Impact Assessment Summary

Based on the scope of action described in Chapter 2, all of the training activities would have at least some interaction with noise receptors. [Table 3-15](#) identifies potential interactions between the Proposed Action/Subalternative 1 effectors and noise receptors. The location of transient users in the state forests at any given time is not known, and some users would be exposed to elevated noise levels. However, application of mission planning procedures, as identified in Section 2.5, would reduce the exposure as much as is practicable.

Based on the general training activity impact assessment described previously, activities associated with munitions use and aircraft operations could cause adverse impacts and are, therefore, carried forward for site-specific analyses in Chapters 5 (BRSF) and 6 (THSF). These activities are shaded yellow in the table below. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore; these activities are not carried forward for detailed analysis in Chapters 5 and 6.

**Table 3-15. Receptor and Effector Interactions for Noise**

Effector	Noise Receptor Type
	Impacts on Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Land Disturbance	
Land development	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Minimal land development associated with the fencing of up to two emitter sites would be expected to have no effect on transient users or residences. In general, noise from these activities would be localized, low intensity, and short term. <b>Subalternative 1:</b> Same as Proposed Action.
Point impact	
Incidental surface disturbance	
Consumption	
Ground Movement	
Wheeled vehicles	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would be expected to have minimal effect on transient users or permanent residents. Wheeled vehicle training would use existing roadways that are used currently by FFS vehicles, vehicles involved in logging operations, and other vehicles. Noise impacts would be localized to the areas immediately surrounding roadways being used for the particular training event. Noise impacts would be short term, lasting only for the duration of the training event. Different sections of road would be expected to be used on different days to avoid scripted unrealistic training, and so locations near roadways would not be subjected to repeated noise of multiple training events. <b>Subalternative 1:</b> Generally, impacts would be the same as the Proposed Action, with potential noise levels being lower associated with the reduced scope of training activities than the Proposed Action.
Dismounted maneuver	
Use of Expendables	
Blanks/GBS	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. <b>Proposed Action:</b> Use of blanks and GBSs at BRSF would be localized to the areas near the former STOP Camp and the SRYA. Although individual training events would be short-term, training would occur repeatedly over the long term. The hardened campsites are relatively remote from known noise-sensitive locations (e.g., locations such as campsites used by transient users, hiking/horseback riding trails, stables, and permanent residences), and noise impacts would be expected to be of medium intensity. At THSF, under the Proposed Action, noise generating expendables use would be permitted throughout the state forest, subject to certain restrictions as identified in Section 2.5. In order to minimize potential for noise impacts, blank rounds and GBS use would not be permitted within 4,000 feet of the boundary of the state forest or known noise-sensitive locations at the state forest. <b>Subalternative 1:</b> Impacts would generally be the same as the Proposed Action for BRSF. At THSF there would be no use of noise generating expendables permitted, thus no impacts at THSF associated with this activity.

**Table 3-15. Receptor and Effector Interactions for Noise, Cont'd**

Effector	Noise Receptor Type
	Impacts on Permanent Residents and Transient Users (e.g., campers, hunters, and hikers)
Smoke grenades	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would be expected to have no noise effect on transient users or residences. Noise associated with use would be localized, low intensity and short term. <b>Subalternative 1:</b> Same as Proposed Action.
Other/equipment	
Aircraft Operations	The potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. <b>Proposed Action:</b> Overflight noise would be distributed throughout the state forest but would occur with increased intensity and frequency near designated training locations (e.g., LZs/DZs, and approved OHO locations). LZs/DZs and OHO locations would be sited at least 2,200 feet from known noise-sensitive locations, and approach and departure paths would be designed so that noise-sensitive locations are avoided by more than 200 feet laterally. Aircraft would not operate below 500 feet AGL except while engaged in approaches to, departures from, or training at designated LZ/DZ, OHO locations, or Blackwater Airfield. Noise may be annoying to transient users and permanent residents; however, application of mission planning procedures described above would avoid exceeding 55 dB at large numbers of noise-sensitive locations. <b>Subalternative 1:</b> Same as Proposed Action – impact analyses focuses on the LZs/DZs as identified in Section 2.4.
Amphibious Operations	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Amphibious Operations using motorized boats would be conducted in bodies of water that are used currently for motorized boating. Boats used in GLI training would not be expected to differ substantially in noise signature from boats using the water bodies currently. Thus, the increase in use associated with the Proposed Action would not be expected to result in a noticeable increase in noise. <b>Subalternative 1:</b> This activity would not occur, therefore there would be no impact.
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Utilities usage would not increase the baseline noise environment and, thus, would have no effect. <b>Subalternative 1:</b> Same as Proposed Action.

dB = decibels; DZ = drop zone; FFS = Florida Forest Service; GBS = ground burst simulators; GLI = GRASI Landscape Initiative; LZ = landing zone; OHO = overwater hoist operations; SRYA = Santa Rosa Youth Academy; STOP = Short-Term Offender Program

### 3.3.4 Proposed Resource-Specific Mitigations

The following mitigations to minimize adverse noise-related impacts have been identified based on the general impact analyses conducted in Section 3.3:

- Aircraft would not operate below 500 feet AGL except while engaged in approaches to, departures from, or training at designated LZ/DZ, OHO locations, or Blackwater Airfield.
- LZ/DZs would be sited at not less than 2,200 feet from known noise-sensitive locations. Known noise-sensitive locations include campgrounds, hiking/horseback riding trails, stables, and privately owned parcels with at least one residential structure.
- Maneuvers near the LZ/DZ (i.e., initial approach, departure, circling and pattern work at less than 500 feet AGL) would not be conducted at distances less than 200 feet from known noise-sensitive locations.
- OHO locations would not be located within 2,200 feet of known noise-sensitive locations.

- LZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be permitted in the northern half of Blackwater Airfield.

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### 3.4 SAFETY

This section addresses safety associated with activities conducted by Eglin AFB as they relate to the Proposed Action. Discussed are safety issues associated with flight-based operations, including operations around LZs/DZs and related training, such as ADs. This section also details potential safety impacts of ground- and water-based training activities, including BD and AOs, and the potential for training-related fires.

In addition, this section addresses safety impacts related to EMR emissions from the use of training emitters. EMR emissions are characterized as the emissions of non-ionizing EMR within the radio frequency (RF) and infrared/visual/ultraviolet spectrum used by man-made emitters, including radar systems, telemetry systems, and training emitters. Radar systems and training emitters are considered EMR emitters, and telemetry systems can transmit data by way of microwave data links. The microwave transmitters are considered the only EMR sources associated with telemetry systems. Due to the potential for hazardous human exposure to EMR emissions under the Proposed Action, potential safety issues were analyzed and, where appropriate, measures to reduce the potential for impacts were identified. These mitigations are discussed in Section [3.4.4](#).

#### 3.4.1 Impact Assessment Methodology

The impact assessment methodology for safety comprises a review of regulatory drivers affecting safety; analysis of the Proposed Action and Subalternative 1 and how it could pose safety risks; and evaluation of the significance of potential impacts in terms of type, context, duration, and intensity. These factors are detailed below.

##### 3.4.1.1 Regulatory Drivers

The primary standards and regulations that apply to safety as it relates to the Proposed Action and Subalternative 1 are summarized below.

- Occupational Safety and Health Act (OSA), USC, Title 29, Chapter 15: The OSA is the primary federal law that governs occupational health and safety in the private sector and federal government in the United States. Its main goal is to ensure that employers provide employees with an environment free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. (*Note: Under Title 29 CFR 1960 series, Occupational Safety and Health Administration (OSHA) standards do not apply to military-unique workplaces, operations, equipment, and systems. However, according to DoD instruction, they will be followed insofar as is possible, practicable, and consistent with military requirements.*)

- Forest Protection, Florida Statutes, Title XXXV, Chapter 59: Among other things, this regulation establishes fire safety measures and fire response procedures at state-owned forests/parks.
- Department of Defense Instruction (DoDI) 6055.1, *DoD Safety and Occupational Health (SOH) Program*, dated 19 August 1998: Establishes occupational safety and health guidance for managing and controlling health and safety risks for DoD personnel and operations worldwide during peacetime and military deployments. It specifically addresses risk management, aviation safety, ground safety, radiation safety, traffic safety, occupational safety, and occupational health.
- AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program*, dated 1 June 1996: Identifies occupational safety, fire prevention, and health regulations governing Air Force activities and procedures associated with safety in the workplace.
- Air Force Manual 91-201, *Explosives Safety Standards*, dated 12 January 2011: Regulates and identifies procedures for explosives safety and handling as well as defines requirements for ordnance quantity distances, safety buffer zones, and storage facilities.
- AFI 13-217, *Drop Zone and Landing Zone Operations*, dated 10 May 2007: Requires a survey for safety and environmental considerations of all potential LZs before use.
- AFOSH Standard 48-9, *Electro-Magnetic Frequency (EMF) Radiation Occupational Health Program*: Establishes occupational safety and health guidance for managing and controlling the reduction of RF exposure.
- Eglin Air Force Base Instruction (EAFBI) 13-212, *Range Planning and Operations*, dated 20 December 2010: Establishes procedures for the execution of operations within the Eglin Test and Training Complex. These procedures will be followed by all personnel conducting official business within Eglin Range.
- Air Armament Center Instruction (AACI) 48-102, *Non-Ionizing Radiation Control Program*: Establishes procedures to minimize human hazards from the operation of EMR sources.
- AACI 91-201, *Air Force Development Test Center (AFDTC) Test Safety Review Process*.
- AACI 91-203, *AFDT Safety Program*.
- DoD Instruction 6055.11, *Protection of DoD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers*.
- AFI 13-212, Volume II: *Weapons Range Management*.



### 3.4.1.2 Assessment Method

Issues that could affect safety were evaluated relative to the degree to which the activity would increase or decrease safety risks to military personnel, the public, and property ([Table 3-16](#)). For example, the analysis evaluated whether proposed aircraft training activities would pose any new or unique risks to military personnel or the general public over those currently experienced at the proposed training and emitter locations. Likewise, the analysis evaluated whether current practices would be adequate to prevent wildland fires from the proposed Use of Expendables.

**Table 3-16. Definitions of Impact Attributes for Safety Resource Categories**

Attribute	Military Personnel	General Public
Contexts Analyzed		
Regional/Population	County level, state park level, or management unit level effects; impacts to populations.	
Localized	Less than management area effects; impacts to individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive change in the safety environment that results in elimination of existing unavoidable, high-level safety risks (such as loss of life or property) or introduction of new unavoidable, high-level safety risks. Examples include closure of a hazardous test and/or training area or introduction of a new hazardous test and/or training area.	
Medium	Moderate change in the safety environment that may result in a relative reduction or increase in potential safety risks, potentially resulting in injury or damage to property. Examples include reduced or increased potential for wildfire in existing wildfire-prone areas.	
Low	Slight change in the safety environment that may relatively increase safety risk but does not pose a potential for injury or damage to property to military personnel or the general public.	
Neutral	No perceptible health or safety impacts.	
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

### 3.4.1.3 Impact Levels

This section addresses the potential for the Proposed Action to increase safety risks, as well as the Air Force's capability to manage these risks. The level of impact associated with safety and the impact's potential significance is determined by considering how Proposed Action and Subalternative 1 effectors could interact with the safe operation of aircraft/equipment and the safety of military personnel, the public, or property in terms of context, intensity, and duration as described in [Table 3-16](#). [Table 3-17](#) explains the impact level categories for safety analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-17. Impact Level Categories for Safety**

Level of Impact	Safety Receptors
Adverse	Adverse safety impacts may result in hazards to military personnel or the general public, the level of impact directly related to the impact attributes described in <a href="#">Table 3-16</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if safety procedures could not be expected to adequately reduce the risk and risks could result in loss of life and/or property. Insignificant safety impacts may occur under medium-intensity scenarios of any duration where safety hazards to military personnel and the public are potentially increased over the baseline condition but could be mitigated by minimal modification of established safety procedures.
Neutral/no effect	Activities do not pose a potential risk for injury to military personnel or the general public or cause damage to property. Established procedures adequately control safety risks or improve the safety condition of military personnel or the general public.

### 3.4.2 General Emitter Activity Impact Assessment

As it relates to EMR, human exposure is defined as exposure to hazardous levels of EMR that would result in adverse biological effects. These hazard safety levels, referred to as permissible exposure limits (PELs), are used to develop safety standards for the operation and maintenance of EMR emitters.

EMR exposure from an emitter source depends on several factors related to the operational parameters of the emitter, including the type of emitter, the system power density, the location of the emitter, and its proximity to anthropogenic and biological (plants or animals) organisms. The potential impacts from radar systems and microwave transmitters can be assessed using hazard areas. Human hazard areas are based on exposure levels, and are regulated, maintained, and controlled by 96 AMDS/SGPB to ensure that the general public and military personnel are not exposed to hazardous levels of EMR. The height of the radar system is also considered to understand how high above the ground the hazard exists. In general, radar systems are frequently equipped with a mitigating measure (elevation interlock) that shuts the system down if the radiating beam drops below horizontal, reducing the chance of exposure to terrestrial organisms (U.S. Air Force, 2003).

Three types of emitter systems would be utilized under the Proposed Action: the KTM system, the MCM system, and the JTE. The MCM and KTM systems do not emit EMR. The JTE does emit EMR and, therefore, could adversely impact humans. JTE systems have three primary components: the threat emitter unit (TEU) radar emitters, the TEU pedestal emitters, and the command and control unit (C2U) identification, friend or foe (IFF) antenna. Each component presents the potential for EMR exposure to anthropogenic receptors.

Based on a JTE systems safety hazard analysis (SSHA) report, personnel must maintain at least 400 feet from the TEU radar emitters, TEU pedestal emitters, and C2U antennas during operation to comply with the OSHA radiation limit of 10 milliwatts per square centimeter ( $\text{mW}/\text{cm}^2$ ). Encroaching within the 400 feet hazard area can result in adverse effects to humans. Additionally, EEDs must maintain a safe distance of 268.7 feet, and fuel must be stored no closer than 198.3 feet from the JTE to comply with the  $5\text{-mW}/\text{cm}^2$  radiation limit (MTC and Northrop, 2008). The human hazard area was overlaid at each of the proposed emitter sites to determine the anthropogenic

receptors potentially affected by EMR exposure. [Table 3-16](#) defines the level of impacts that could potentially occur from EMR exposure.

Based on the scope of action described Chapter [2](#), EMR exposure from emitter activities could impact the following receptors that may be proximate to the proposed emitter sites: members of the general public, FFS resident staff, FFS daily staff, and sheriff department staff (see [Table 2-1](#) in Chapter [2](#)). The MCM and KTM systems do not radiate EMR; therefore, no significant or adverse effects would occur. Adverse impacts would occur if the JTE emitter's safety hazard area interferes with areas open to the general public. However, as part of the Proposed Action, emitters would be placed in accordance with the SHDs described in the 2008 SSHA report to avoid populated areas (habitable buildings, recreation sites, etc.) and comply with the OSHA radiation limits. The emitter sites would also be fenced, or have other security measures in place to prevent unauthorized personnel from entering the safety hazard areas.

The use of emitters and associated EMR exposure could also impact biological resources (Section [3.8](#)), land use (Section [3.10](#)), and socioeconomic resources (minority and low-income populations) (Section [3.11](#)). Potential impacts to these resource areas are discussed in the respective sections. EMR exposure is not expected to impact any other resource areas. Site-specific emitter use is further detailed in Chapter [4](#).

During the scoping period for this Proposed Action, members of the public expressed safety concerns over the interaction between emitters and in-flight pilot instrumentation. The use of training emitters would not impact civil air traffic or the ATC system. Training emitters transmit at a specific frequency to simulate a threat. Civil air traffic would only detect the threat if the aircraft receiver were tuned to the emitter frequency.

### **3.4.3 General Training Activity Impact Assessment**

Based on the scope of action described in Chapter [2](#), the following proposed activities would cause impacts only at a very low to neutral level under both the Proposed Action and Subalternative 1. Therefore, these are not discussed further in this document: land disturbance, ground movement (dismounted movement), and utilities usage. These activities are conducted on a day-to-day basis and would result only in minor potential impacts to safety that would be mitigated through General Operational Constraints identified in Section [2.5](#).

The following training activities could result in potential safety impacts, and are discussed in greater detail in this document: ground movement (i.e., operations with wheeled vehicles), UoEX, aircraft operations (i.e., general flight operations, LZs/DZs, LLH/Es, ADs, and AOs).

The main safety issue to the general public is associated with an increase in the potential for wildfires caused by various training activities. Because activities would occur at a state forest, the FFS has the primary responsibility for prevention, detection, and suppression of wildfires wherever they may occur. The FFS provides leadership and direction in the evaluation, coordination, allocation of resources, and monitoring of wildfire management and protection.

To minimize the potential for fires from the Use of Expendables and general training activities (such as idling vehicles and aircraft), before a mission begins, units would obtain the daily fire danger rating and coordinate with FFS personnel to ensure that adequate fire response is available if needed. Under Florida law, it is unlawful for any person to set fire to, or cause fire to be set to, any wildlands or to build a campfire or bonfire or to burn trash or other debris within the designated area of a severe drought emergency unless a written permit is obtained from the division or its designated agent. Units would also appoint a fire marshal on a daily basis while in the field to ensure all personnel have been trained concerning the safe use of incendiary devices and to supervise the immediate suppression of fires. All fires would be reported as soon as possible to the FFS and to local fire department, as necessary.

Standard operating procedures (SOPs) and associated General Operational Constraints in Section [2.5](#) prescribe the regulations and general precautions to be taken in the Use of Expendables and energy-producing equipment, as well as the use of training/maneuver areas, airspace, and landing and drop zones. Safety procedures associated with routine training operations are designed to minimize or altogether eliminate risks to the public. These procedures would be implemented through the individual organization, based on its specific training protocols/guidance. Potential impacts related to proposed activities and existing safety procedures to minimize these impacts would be applied at both BRSF and THSF and are discussed below.

#### **Ground Movement (Wheeled Operations)**

Routine vehicle operations would be conducted in accordance with established traffic laws and would present minimal risks. However, NVG/BD is considered a high-risk training event. To perform NVG operations at Eglin AFB, a risk management plan must be prepared in accordance with the unit's command policy statement for each exercise utilizing NVGs; this same procedure would be applied at BRSF and THSF.

BD must occur only on roads designated for this use and that are closed to the public. Additionally, commanders must establish NVG speed limits consistent with weather, terrain, and the NVG driving skill level of all soldiers participating as assessed in the risk management plan. However, speed limits would not exceed 15 miles per hour. Commanders must also ensure driver/operators that have not driven under NVG conditions in the past six months receive organizational refresher training prior to participating in NVG driving operations.

Finally, trainers must ensure that safety briefings include a review of NVG limitations (especially the restriction of peripheral vision), limits in seeing through obscurants (smoke, fog, dust), and the need for preventive maintenance. Under Subalternative 1, NVG/BD would not occur.

#### **Use of Expendables**

Ground-burst simulators and smoke cartridges would be employed as part of the Proposed Action at hardened camp sites at BRSF and in unconstrained areas of THSF per Section [2.5](#), while under Subalternative 1 these items would only be used at the hardened camp sites of BRSF. Ground-burst simulators replicate the detonation of artillery and mortar projectiles or artillery-type rockets. They typically produce a high-

pitched whistle that lasts two to four seconds and then detonate with a loud report and brilliant flash. Smoke cartridges are used by ground soldiers to signal aircraft. They are designed to produce a smoke cloud that lasts up to 30 seconds. The devices operate by burning and/or detonating a small pyrotechnic charge. Safety procedures are currently in place to prevent potential injuries associated with loud noises or with flying debris generated during detonation of these devices. These procedures include training personnel in the proper use of these devices and the implementation of applicable safety or exclusion zones, depending on the type of pyrotechnics used.

UoEX also poses a danger for causing a fire; the major causes of forest fires at Eglin AFB are incendiary training aids such as flares, blanks, simulators, pyrotechnics, and smoke grenades, as well as incendiary ammunition and incendiary and smoke devices dropped from aircraft. Other causes fires not related to training aids are typical causes of wildfires at locations outside of military testing and training areas. These include careless use of cigarettes and matches, improper control of campfires, and vehicle ignition/idling on dry grass. The potential for wildfire at both BRSF and THSF would increase over the baseline condition due to the Use of Expendables.

At Eglin AFB, climatic conditions may dictate restrictions on the types of munitions to be fired during portions of the year to minimize the danger of fires, and this would be applied at BRSF and THSF in coordination with state forest managers in conjunction with state forest fire ratings. Since 2009, approximately 300 fires have occurred at Eglin AFB as a result of military mission activities; it is unknown exactly how many are related to the Use of Expendables. Before a mission begins, units must obtain the daily fire danger rating by visiting the Eglin AFB Environmental Management Homepage. Adherence to these pyrotechnics restrictions is mandatory. Fire ratings for operations are listed below.

- Fire danger low – No restrictions on missions.
- Fire danger moderate – No restrictions on pyrotechnics. A fire watch must be posted for at least 20 minutes after completing the use of pyrotechnics.
- Fire danger high – Use caution with pyrotechnics. Post a fire watch for a minimum of 30 minutes after completing use of pyrotechnics. Extra precautions required for campfires.
- Fire danger very high – Restrict pyrotechnics to hand-thrown simulators or smoke grenades. No flares of any type. Use simulators or grenades only on roads or in pits. Cleared areas for pyrotechnics should be a minimum of 1.5 times the blast radius. No campfires.
- Fire danger extreme – No pyrotechnics allowed without prior approval from the Wildland Fire Program Manager (WFPM) or designee at the Eglin AFB Natural Resources Section.

All training activities would adhere to General Operational Constraints identified in Section [2.5](#), which include coordination with each respective FFS forest dispatch to obtain the current fire rating for the respective forest prior to training. Units must also appoint a fire marshal on a daily basis (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while in the field to ensure all personnel



have been trained concerning the safe use of incendiary devices and to supervise the immediate suppression of fires. All fires must be reported as soon as possible to the respective forest operations center.

### **Aircraft Operations**

Eglin AFB has well-established procedures for proposed training operations, including the use of LZs/DZs, low-level insertions, ADs, and OHO. These procedures would be utilized for training activities under the Proposed Action.

Procedures include mandatory use of a landing zone controller (LZC)/drop zone controller (DZC) for all helicopter operations, and during hours of darkness for fixed-wing air-land operations. LZC/DZC personnel would be responsible for all activities on and immediately above the landing zone/drop zone (LZ/DZ). The LZC/DZC would attend the crew briefing to discuss issues such as position of block letters, runway lighting, radio frequencies, etc. As a minimum, the LZC/DZC must coordinate with the aircrew prior to the aircrew departing for the aircraft. Ambulance and crash rescue support must also be coordinated during the scheduling process.

The LZC/DZC would coordinate a drop/landing zone closure plan to include temporary obstructions (cones) and signage. The LZC/DZC would also implement the access control plan and ensure the area is safe for operations. Established procedures require that the LZC/DZC contact the Range Operations Control Center (ROCC) at least 30 minutes before operations begin to take responsibility for the area, to ensure that the airspace/mission has been activated.

Prior to making this call, the LZC/DZC would ensure the range/area closure plan has been implemented and all nonparticipating personnel are clear of hazardous operations. The LZC/DZC would maintain two-way radio communication with the drop aircraft and with Eglin AFB Mission Control. In the event of radio communication failure, a single red smoke grenade or other established visual signal would be used to indicate “no drop” and operations would be suspended until air-to-ground communications are reestablished.

When helicopter operations are being conducted at a remote site not involving a mission profile, the Eglin Radar Control Facility (ERCF) issues visual flight rules (VFR) traffic advisory information on a workload permitting basis to all aircraft transiting the area occupied by the helicopter, to include operation area and corresponding altitudes, if known. The transient altitude for all rotary wing aircraft across VFR corridors shall be at or below 500 feet AGL unless otherwise directed by Eglin AFB Mission Control.

Over the last 15 years, approximately 42 fatal overland aircraft mishaps occurred in northwest Florida (extending from Tallahassee to Pensacola). All of these mishaps were associated with general aviation (nonmilitary aircraft) (National Transportation Safety Board [NTSB], 2013). There have been no fatal overland mishaps involving military aircraft, and there are no recorded mishaps associated with collisions between general aviation and military aircraft.

Over the same period, there have been a few nonfatal aircraft mishaps involving military aircraft. The most significant of these were a June 2012 crash of a Bell-Boeing CV-22B

Osprey during a routine training mission on the Eglin AFB reservation, and a November 2012 crash of a Tyndall AFB F-22 fighter just south of Panama City.

To minimize the potential for mid-air collisions or near misses with other aircraft in the region when conducting LZ/DZ, or other similar training, the ERCF would issue a VFR traffic advisory to all aircraft transiting the area being used by the military. Eglin AFB would continue to implement its Mid-Air Collision Avoidance (MACA) Program. This program is designed to help increase military pilot awareness of the training airspace and activities. Implementation of established procedures would ensure that the potential for mishaps involving military aircraft continues to be extremely low.

In case of an in-flight emergency, military pilots are trained take all appropriate emergency measures, including avoiding populated areas, if at all possible. Eglin AFB personnel have extensive training and experience on how to respond to and deal with an aircraft mishap. Eglin AFB, as well as the state forests, also maintain numerous mutual support agreements with local fire/emergency services departments detailing procedures for responding to such emergencies. These procedures include measures to respond to fire or releases of fuel.

Consequently, negligible impacts would be anticipated from implementation of the proposed action with respect to aircraft mishaps.

For OHO activities the training unit, in conjunction with the organizational safety officer, must evaluate each operation in or over water (to include a risk analysis) to determine required safety measures based on type of operations, existing or expected conditions, and existing policy.

The V-22 (Osprey) also poses a greater risk of starting wildfires than other aircraft. The V-22 rotates its engines to a vertical position for takeoffs and landings. If the aircraft is operating over very dry vegetation, the hot downwash from the engines has the potential to cause a brush fire underneath. For example, in June 2013, a Marine MV-22 started a grass fire at the Dare County Bombing Range in North Carolina. It is unknown if the fire occurred during takeoff or landing. The fire caused minor damage to the aircraft, and the burning vegetation had been contained before the Fire Department arrived (Jacksonville Daily News, 2013). To avoid potential wildfires, as part of normal operational constraints, V-22 operations would be restricted on days with high or greater fire danger, or alternatively, additional fire response personnel would be made available to extinguish any small fires before they could spread.

### **Amphibious Operations**

These include AOs by boats/personnel. As part of general operating constraints identified in Section [2.5](#), all land-water transitions involving boats coming ashore must use approved boat landing sites. Water operations must also include a boat operator and a qualified safety swimmer for every boat. Medical coverage must be in place prior to OHO or personnel ADs into the water. If medical personnel are not in the same safety boat as the DZC, communications must be ensured. Under Subalternative 1, amphibious operations would not occur.

Implementation of the procedures described above, as they relate to specific training

activities, would minimize or eliminate potential adverse impacts to safety.

### 3.4.3.1 General Training Activity Impact Assessment Summary

[Table 3-18](#) summarizes potential interactions between Proposed Action effectors and safety resource effectors. Based on the general training activity impact assessment described previously, activities associated with UoEX could cause adverse impacts and are, therefore, carried forward for site-specific analyses in Chapters [5](#) (BRSF) and [6](#) (THSF). These activities are shaded yellow in the table below. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

**Table 3-18. Receptor and Effector Interactions for Safety Resources**

Table 3-1: Safety Receptor and Effector Interactions for Safety Resources		
Effector	Safety Receptor Type	
	Military Personnel	General Public
Land Disturbance		
Land development	No effect to the current safety environment; This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Construction activities would follow established Air Force and OSHA-related safety requirements. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with reduced level of proposed activity.	
Point impact	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> These activities would be localized, neutral in intensity, and short term; thus, they would not result in increases to the baseline safety environment and would be expected to have no effect. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with reduced level of proposed activity.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for injury from traffic accidents or as a result of NVG/Blackout Driving training. However, this potential would be mitigated through SOPs and safety measures. <b>Subalternative 1:</b> NVG/Blackout driving would not occur. Same as Proposed Action for other activities.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Little potential for impacts; normal traffic rules would apply to use of wheeled vehicles on roadways, and Blackout Driving would occur only on roads designated for this use that are closed to the public during training activities. <b>Subalternative 1:</b> NVG/Blackout driving would not occur. Same as Proposed Action for other activities.
Dismounted maneuver	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would be expected to have no effect on the safety environment for military personnel or the general public. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with reduced level of proposed activity.	
Use of Expendables		
Blanks/GBS	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for injuries associated with loud noises, burns, or flying debris from detonation of these devices. However, these risks to military personnel are inherent to these types of training activities and are mitigated to the extent possible through implementation of SOPs and safety measures. This activity would be expected to have no effect on transient users or residences. <b>Subalternative 1:</b> Same as Proposed Action	<b>Proposed Action:</b> The general public would not be exposed to direct impacts from Use of Expendables given implementation of training SOPs, safety measures, and avoidance of the general public during use. Risk of wildfire is increased due to Use of Expendable (GBS, smoke grenades, generators, etc.), which could affect the safety of the general public. <b>Subalternative 1:</b> Same as Proposed Action for BRSF; the potential for adverse impacts has been identified. This issue area has been carried forward for site-specific analysis. <b>At THSF this activity would not occur</b>
Smoke grenades		

**Table 3-18. Receptor and Effector Interactions for Safety Resources, Cont'd**

Effector	Safety Receptor Type	
	Military Personnel	General Public
	for BRSF; at THSF this activity would not occur.	
Other/equipment	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Use of other equipment (generators, etc.) would have no effect on the safety environment for military personnel. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with reduced level of proposed activity.	
Aircraft Operations	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There is a minor potential for impacts resulting from an aircraft mishap, airdropped items, personnel falls, etc. However, these potential safety risks would be mitigated through flight controls and training SOPs. Use of roadways for landing strips would be accomplished through road closures to avoid safety impacts to the public. There would be little to no effect on the existing safety environment from aircraft operations. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with reduced level of proposed activity.	
Amphibious Operations	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There is an inherent potential for drowning and boating mishaps during Amphibious Operations. As with other operations, these activities would be conducted in accordance with established training SOPs and safety measures. As a result, these activities would be expected to have no effect on the existing safety environment for military personnel. <b>Subalternative 1:</b> This activity would not occur.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> These activities would be designed to avoid interactions with the public, thus eliminating the potential for boating mishaps/interaction with the general public. As a result, no effect to public safety is expected. <b>Subalternative 1:</b> This activity would not occur.
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would not result in safety impacts and would be expected to have no effect. <b>Subalternative 1:</b> Same as Proposed Action.	

BRSF = Blackwater River State Forest; GBS = ground burst simulator; NVG = night vision goggle; OSHA = Occupational Safety and Health Administration; SOP = standard operating procedure; THSF = Tate's Hell State Forest

### 3.4.4 Proposed Resource-Specific Mitigations

Based on the general impact analyses presented in Section 3.4, no Resource-Specific Mitigations for safety have been identified.

## 3.5 AIR QUALITY

For purposes of this EIS, the term “air quality resources” refers to air within the region where the Proposed Action would occur. This component is referred to as a “receptor.” Air quality is affected by three primary sources of air pollutants: stationary (factories or power plants), mobile (cars, planes, trains), and natural (windblown dust or volcanic

eruptions). The air quality assessment considers the six criteria pollutants primarily from mobile sources and munitions as well as greenhouse gas (GHG) emissions.

### 3.5.1 Impact Assessment Methodology

The impact assessment for air quality evaluates the potential impacts of the Proposed Action on air quality. Impacts to air quality resources are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

#### 3.5.1.1 Regulatory Drivers

Laws and regulations applicable to the Proposed Action for air quality and greenhouse gases are summarized in this section.

##### Air Quality

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The severity or nonseverity of a pollutant's concentration in a region or geographical area is determined by comparing it with federal and/or state ambient air quality standards. Under the authority of the Clean Air Act (CAA), the USEPA has established nationwide air quality standards to protect public health and welfare with an adequate margin of safety.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Further discussion of the NAAQS and state air quality standards are included in Appendix D, *Air Quality*.

Based on measured ambient air pollutant concentrations, the USEPA designates whether areas of the U.S. meet the NAAQS. Those areas demonstrating compliance with the NAAQS are considered "attainment" areas, while those not compliant are known as "nonattainment" areas. Those areas that cannot be classified on the basis of available information for a particular pollutant are "unclassifiable" and are treated as attainment areas until proven otherwise.

##### Greenhouse Gases

GHGs are chemical compounds in the earth's atmosphere that trap heat in the atmosphere, thus regulating the earth's temperature. Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) are examples of GHGs that have both natural and man-made sources, while other gases such as those used for aerosols are exclusively man-made.

The six primary GHGs, which are internationally recognized and regulated under the Kyoto Protocol, are CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). There are other GHGs, such as water vapor and



ozone, but for purposes of this EIS, GHGs are defined in accordance with Section 19(i) of Executive Order (EO) 13514 as the aforementioned primary six GHGs.

These six key GHGs have been found to threaten public health and welfare (USEPA's Endangerment Finding). The state of Florida has taken steps to reduce GHG emissions over a 10-year period by adopting maximum emission levels for electric utilities and adopting California motor vehicle emission standards. Detailed discussions of GHG regulations are included in Appendix D, *Air Quality*.

### 3.5.1.2 Assessment Method

#### Air Quality

To evaluate air emissions and their impact on the overall region of influence (ROI), the emissions associated with the project activities were compared with the total county emissions on a pollutant-by-pollutant basis, using the USEPA's 2011 National Emissions Inventory (NEI) data (USEPA, 2014). The county data include emissions data from point sources, area sources, and mobile sources. "Point sources" are stationary sources that can be identified by name and location. "Area sources" are point sources of emissions too small to track individually, such as individual homes, small office buildings, or diffuse stationary sources (e.g., wildfires or agricultural tilling equipment). "Mobile sources" are vehicles or equipment with gasoline or diesel engines, e.g., an airplane or a ship. Two types of mobile sources are considered: on-road and nonroad. *On-road* mobile sources are vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. *Nonroad* sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2009).

Potential impacts to air quality are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. [Table 3-19](#) defines how these impact attributes are applied to air quality and greenhouse gases.

For a conservative analysis, the affected counties were selected as the ROI instead of the USEPA-designated Air Quality Control Region (AQCR), which is a much larger area. Calculated air emissions were compared with the annual total emissions of Okaloosa and Santa Rosa Counties for BRSF activities. For operations on THSF, calculated air emissions were compared with the annual emissions for Franklin County.

The Air Conformity Applicability Model (ACAM) Version 4.5.0 was also utilized to provide a level of consistency with respect to emissions factors and calculations. The ACAM provides estimated air emissions from proposed federal actions in areas designated as nonattainment and/or maintenance for each criterion and precursor pollutant, as defined in the NAAQS. The ACAM provided user inputs for construction, grading, and paving activities; these inputs were then used to calculate emissions. Aircraft operations, vehicles, and munitions were calculated using emission factors and calculation methods from AP-42 and the *Air Emissions Guide for Air Force Mobile Sources*. The air quality analysis focused on emissions associated with the construction activities, flight operations, munitions, and vehicle use.

### Greenhouse Gases

The potential effects of GHG emissions from the Proposed Action are by nature global. Given the global nature of climate change and the current state of the science, it is not useful at this time to attempt to link the emissions quantified for local actions to any specific climatological change or resulting environmental impact. Nonetheless, the GHG emissions from the Proposed Action and alternatives have been quantified to the extent feasible in this EIS for information and comparison purposes.

On December 18, 2014, the CEQ released its Revised Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, which suggests that proposed actions that would be reasonably anticipated to emit 25,000 metric tons or more of carbon dioxide equivalent (CO<sub>2</sub>e) GHG emissions should be evaluated by quantitative and qualitative assessments. This is not a threshold of significance but a minimum level that would require consideration in NEPA documentation. The purpose of quantitative analysis of CO<sub>2</sub>e GHG emissions in this EIS is for its potential usefulness in making reasoned choices among alternatives. [Table 3-19](#) defines how the impact attributes of context, intensity, and duration are applied to air quality analyses.

**Table 3-19. Definitions of Impact Attributes for Air Quality Categories**

Attribute	Air Quality	Greenhouse Gases
Contexts Analyzed		
Regional/population	Air Quality Control Region (AQCR); impacts to populations.	
Localized	County level area effects; impacts to small segments of affected population or individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive change in emissions in the region exceeding local air quality guidelines.	Change in regional greenhouse gas (GHG) emissions greater than 25,000 metric tons (27,557 tons).
Medium	Moderate change in emissions in the region near local air quality guidelines.	Moderate change in regional GHG emissions near local air quality guidelines.
Low	Slight change in emissions within local air quality guidelines.	Slight change in GHG emissions within local air quality guidelines.
Neutral	No perceptible increase in emissions.	
Duration		
Long term	Effect would likely endure for the life of the action	
Medium term	Effect would likely last for a few months to a year	
Short term	Effect would likely last for a few days to weeks	

#### 3.5.1.3 Impact Levels

The level of impact associated with noise and the impact's potential significance is determined by considering how Proposed Action effectors could interact with the existing baseline noise environment and noise resource categories (e.g., context) in terms of intensity (e.g., Proposed Action noise levels) and duration as described in [Table 3-19](#). [Table 3-20](#) explains the levels of impacts for air quality analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-20. Impact Level Categories for Air Quality**

Level of Impact	Air Quality	Greenhouse Gases
Adverse	Adverse impacts are associated with increases in air pollutant emissions such that emissions are comparable to air quality emission standards. Significant adverse impacts may occur under long- to medium-term, high-intensity impacts that result in exceedance of regional air pollutant emission guidelines and standards. Insignificant impacts may result from short- to medium-term, medium-intensity impacts that increase the regional air pollutant emissions but within regional air pollutant guidelines and standards.	
Neutral/no effect	Short-term impacts that result in minimal increase in regional air pollutant emissions.	

### 3.5.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not result in significant adverse impacts to air quality, because the emitter sites are located across a large area and would only produce small amounts of air pollutant emissions to the region from generator use. The use of temporary emitter sites would have no impacts to air quality at sites that have access to power. Transport of emitters to the sites and the use of generators would produce small amounts of emissions and would be expected to result in short-term impacts. Air emissions associated with emitter use are provided in Chapter 4, Section 4.5.

### 3.5.3 General Training Activity Impact Assessment

#### Proposed Action

Air emissions would result from the following activities: ground movement (wheeled vehicle use), expendable use (training munitions), aircraft operations, and AO. Because the movements and use of each of the locations is not known, it was assumed that the maximum use of vehicles, expenditures, aircraft, and personnel would be used during each event.

#### Ground Movement

Ground movement would result in fugitive dust and fossil fuel-use emissions from wheeled vehicles utilizing dirt roadways. Estimated air emissions have been calculated for these activities and are provided in Table 3-21 and Table 3-22. Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-21. Proposed Action Fugitive Dust Emissions**

Source	PM (tons/event)	PM (tons/year)
Roadway Vehicle Use	0.91	3.65
Blackout Driving	0.25	1.01
Bivouacking/Assembly Areas	0.08	0.76
Communications and Surveillance Operations	0.08	0.91
Opposing Forces Vehicle Operations	0.89	29.27
Hardened Camp Site Use	3.55	6.86
<b>Total</b>	<b>5.76</b>	<b>42.46</b>

PM = particulate matter

**Table 3-22. Proposed Action Wheeled Vehicle Air Emissions**

Source	Emissions (tons/event)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Roadway Vehicle Use	2.74	0.01	0.09	0.10	0.00	2.87	9.76
Blackout Driving	0.76	0.00	0.03	0.03	0.00	0.80	2.71
Bivouacking/Assembly Areas	0.23	0.00	0.01	0.01	0.00	0.23	0.53
Communications and Surveillance Operations	0.23	0.00	0.01	0.01	0.00	0.23	0.53
Opposing Forces Vehicle Operations	0.05	0.15	0.01	0.01	0.01	0.01	15.90
Hardened Camp Site Use	0.20	0.61	0.03	0.03	0.05	0.03	63.59
<b>Total/Event</b>	<b>4.21</b>	<b>0.77</b>	<b>0.17</b>	<b>0.19</b>	<b>0.06</b>	<b>4.17</b>	<b>93.03</b>
Source	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Roadway Vehicle Use	10.98	0.03	0.38	0.41	0.01	11.48	39.06
Blackout Driving	3.05	0.01	0.10	0.11	0.00	3.19	10.85
Bivouacking/Assembly Areas	2.28	0.01	0.07	0.08	0.00	2.28	5.28
Communications and Surveillance Operations	2.74	0.01	0.09	0.10	0.00	2.74	6.33
Opposing Forces Vehicle Operations	1.62	5.00	0.24	0.25	0.37	0.28	524.66
Hardened Camp Site Use	0.38	1.17	0.06	0.06	0.09	0.07	122.95
<b>Total/Year</b>	<b>21.05</b>	<b>6.23</b>	<b>0.95</b>	<b>1.01</b>	<b>0.47</b>	<b>20.03</b>	<b>709.12</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### Expendable Use

Estimated air emissions have been calculated for training munitions use and are provided in [Table 3-23](#). Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-23. Proposed Action Expendable Use Emissions**

Munitions Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC	CO <sub>2e</sub>
Estimated average/event	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### Aircraft Operations

Aircraft operations would result in fossil fuel-use emissions from fixed- and rotary-wing aircraft use. Estimated air emissions have been calculated for these activities and are provided in [Table 3-24](#). Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-24. Proposed Action Aircraft Emissions**

Source	Emissions (tons/event)						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.04	0.12	0.03	0.03	0.01	0.01	9.98
Airdrops	0.09	0.43	0.11	0.12	0.02	0.00	19.95
Air/Land Vertical Lift	0.02	0.06	0.015	0.015	0.005	0.005	9.06
Overwater Hoist Operations	0.02	0.06	0.01	0.01	0.01	0.01	3.15
Hardened Camp Site Use	0.05	0.06	0.01	0.01	0.01	0.01	15.73
<b>Total/Event</b>	<b>0.22</b>	<b>0.73</b>	<b>0.18</b>	<b>0.19</b>	<b>0.06</b>	<b>0.04</b>	<b>57.87</b>
Aircraft Activity	Emissions (tons/year) <sup>1</sup>						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.51	1.41	0.30	0.34	0.16	0.12	120
Airdrops	21.49	99.20	24.66	28.95	5.66	0.53	4,629
Air/Land Vertical Lift	4.94	13.625	2.91	3.275	1.56	1.19	2,315
Overwater Hoist Operations	0.26	0.70	0.15	0.17	0.08	0.06	38
Hardened Camp Site Use	2.47	6.81	1.46	1.64	0.78	0.60	3,649
<b>Total/Year</b>	<b>29.67</b>	<b>121.75</b>	<b>29.48</b>	<b>34.38</b>	<b>8.24</b>	<b>2.50</b>	<b>10,751</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

### Amphibious Operations

AO requires the use of watercraft, which would result in fossil-fuel use related emissions. [Table 3-25](#) provides estimated air emissions from use of watercraft. Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-25. Proposed Action Amphibious Operations Emissions**

Source	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Amphibious Operations/event	0.00	0.00	0.00	0.00	0.05	0.44	0.00
Amphibious Operations/year	0.01	0.01	0.00	0.01	0.48	4.42	0.00

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### Subalternative 1 (Preferred Alternative)

Air emissions would result from the following activities: ground movement (wheeled vehicle use), expendable use (training munitions), and aircraft operations.

#### Ground Movement

Under Subalternative 1, ground movement would be less than the Proposed Action due to the reduced number of activities. However, there would still be fugitive dust and fossil fuel-use emissions from wheeled vehicles utilizing dirt roadways. The estimated air emissions would be slightly lower than under the Proposed Action and are provided in [Table 3-26](#) and [Table 3-27](#). Air emissions calculations are provided in Appendix D, *Air Quality*.



**Table 3-26. Subalternative 1 Fugitive Dust Emissions**

Source	PM (tons/event)	PM (tons/year)
Roadway Vehicle Use	0.91	3.65
Communications and Surveillance Operations	0.08	0.91
Opposing Forces Vehicle Operations	0.89	29.27
Hardened Camp Site Use	3.55	6.86
<b>Total</b>	<b>5.43</b>	<b>40.69</b>

PM = particulate matter

**Table 3-27. Subalternative 1 Wheeled Vehicle Air Emissions**

Source	Emissions (tons/event)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Roadway Vehicle Use	2.74	0.01	0.09	0.10	0.00	2.87	9.76
Communications and Surveillance Operations	0.23	0.00	0.01	0.01	0.00	0.23	0.53
Opposing Forces Vehicle Operations	0.05	0.15	0.01	0.01	0.01	0.01	15.90
Hardened Camp Site Use	0.20	0.61	0.03	0.03	0.05	0.03	63.59
<b>Total/Event</b>	<b>6.95</b>	<b>0.78</b>	<b>0.27</b>	<b>0.29</b>	<b>0.06</b>	<b>7.03</b>	<b>102.79</b>
Source	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Roadway Vehicle Use	10.98	0.03	0.38	0.41	0.01	11.48	39.06
Communications and Surveillance Operations	2.74	0.01	0.09	0.10	0.00	2.74	6.33
Opposing Forces Vehicle Operations	1.62	5.00	0.24	0.25	0.37	0.28	524.66
Hardened Camp Site Use	0.38	1.17	0.06	0.06	0.09	0.07	122.95
<b>Total/Year</b>	<b>15.72</b>	<b>6.21</b>	<b>0.77</b>	<b>0.82</b>	<b>0.47</b>	<b>14.57</b>	<b>693</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### Expendable Use

Estimated air emissions for Subalternative 1 would be slightly decreased from the Proposed Action and would be localized to the STOP and SRYA hardened camp sites ([Table 3-23](#)). Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-28. Subalternative 1 Expendable Use Emissions**

Munitions Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC	CO <sub>2e</sub>
Estimated average/event	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum emissions/year	0.14	0.02	0.75	0.21	0.00	0.00	0.30

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### Aircraft Operations

Aircraft operations would result in fossil fuel-use emissions from fixed- and rotary-wing aircraft use. Estimated air emissions have been calculated for these activities and are provided in [Table 3-29](#). Estimated emission under Subalternative 1 would be less than the Proposed Action due to decreased number of proposed operations. Air emissions calculations are provided in Appendix D, *Air Quality*.

**Table 3-29. Subalternative 1 Aircraft Emissions**

Source	Emissions (tons/event)						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.00	0.01	0.00	0.00	0.00	0.00	0.83
Airdrops	0.02	0.07	0.02	0.02	0.00	0.00	3.39
Air/Land Vertical Lift	0.01	0.03	0.01	0.01	0.00	0.00	4.53
Overwater Hoist Operations	0.02	0.06	0.01	0.01	0.01	0.01	3.15
Hardened Camp Site Use	0.05	0.06	0.01	0.01	0.01	0.01	15.73
<b>Total/Event</b>	<b>0.10</b>	<b>0.23</b>	<b>0.05</b>	<b>0.05</b>	<b>0.03</b>	<b>0.02</b>	<b>27.63</b>
Aircraft Activity	Emissions (tons/year) <sup>1</sup>						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Low-Level Helicopter Insertions/Extractions (LLHI/E)	0.04	0.12	0.02	0.03	0.01	0.01	10.00
Airdrops	3.65	16.86	4.19	4.92	0.96	0.09	786
Air/Land Vertical Lift	2.47	6.81	1.46	1.64	0.78	0.60	1,157
Overwater Hoist Operations	0.26	0.70	0.15	0.17	0.08	0.06	38
Hardened Camp Site Use	2.47	6.81	1.46	1.64	0.78	0.60	3,649
<b>Total/Year</b>	<b>8.90</b>	<b>31.30</b>	<b>7.28</b>	<b>8.40</b>	<b>2.62</b>	<b>1.36</b>	<b>5,641</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

### Amphibious Operations

There would be no AO under Subalternative 1, and therefore no fossil-fuel use related emissions.

#### 3.5.3.1 General Training Activity Impact Assessment Summary

[Table 3-30](#) provides a summary of general training activity impact analysis. Based on the impact assessment described previously, use of wheeled vehicles, expendable use, aircraft operations, and AO would all result in air emissions and are therefore carried forward for site-specific analyses in Chapters [5](#) (BRSF) and [6](#) (THSF); these are shaded yellow. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

**Table 3-30. Receptor and Effector Interactions for Air Quality and Greenhouse Gases**

Effector	Resource Area Potentially Affected (Receptor)	
	Air Quality	Greenhouse Gases
Land Disturbance		
Point impact	These issue areas have not been carried forward for site-specific analysis. <b>Proposed Action:</b> There would be no air emissions associated with these activities. <b>Subalternative 1:</b> Same as Proposed Action.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	<b>Proposed Action:</b> The potential for adverse impacts has been identified associated with air pollutant emissions from vehicle use. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Same as Proposed Action.	
Dismounted maneuver	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There would be no air emissions associated with this activity. <b>Subalternative 1:</b> Same as Proposed Action.	
Us of Expendables		
Blanks/GBS	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> The potential for adverse impacts has been identified associated with air pollutant emissions released from munitions, smoke grenades, generators, etc. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Same as Proposed Action for BRSF; at THSF this activity would not occur.	
Smoke grenades		
Other/equipment		
Aircraft Operations	<b>Proposed Action:</b> The potential for adverse impacts has been identified associated with air pollutant emissions from aircraft engines operating below 3,000 feet above ground level (air mixing height). This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Same as Proposed Action.	
Amphibious Operations	Proposed Action: The potential for adverse impacts has been identified associated with air pollutant emissions from boat engines. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur and therefore there would be no air emissions.	
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There would be no air emissions associated with this activity. <b>Subalternative 1:</b> Same as Proposed Action.	

### 3.5.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section 3.5, no Resource-Specific Mitigations have been identified for air quality.

## 3.6 EARTH RESOURCES

For purposes of this EIS, “earth resources” refers to the geologic and soil resources associated with the land areas proposed for use. Each of these earth resource components is referred to as a “receptor.” Geologic resources are consolidated or unconsolidated earth materials, including ore and aggregate materials, fossil fuels, and significant landforms. Soil is a natural, three-dimensional material composed of solids (minerals and organic matter), liquid, and gases that occurs on the land surface. Soil is characterized by horizons or layers that are distinguishable from the parent material, either as a result of additions, losses, transfers, and/or transformations of energy and matter or the ability to support rooted plants in a natural environment (USDA, 2010).

### 3.6.1 Impact Assessment Methodology

The impact assessment for earth resources evaluates the potential impacts of the Proposed Action on geology and soils. Impacts to these resources are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

#### 3.6.1.1 Regulatory Drivers

For this assessment, regulations relating to earth resource impact potentials are primarily associated with the effects of soil detachment (erosion) and deposition of materials (sedimentation) on aquatic resource water quality and habitats, prime farmland soils, and erodible land. For more information on federal and state water quality regulations refer to Section 3.7.1.1, *Water Resources, Regulatory Drivers*. Laws and regulations applicable to the Proposed Action for earth resources are summarized below.

- Prime farmland soils are protected under the Farmland Protection Policy Act (FPPA) of 1981. The U.S. Department of Agriculture defines prime farmland soils as those best suited to food, feed, forage, fiber, and oilseed crops. Farming these soils produces the highest yields with minimal energy and economic resources expenditures and the least environmental damage. They are generally fertile, are not excessively erodible or saturated by groundwater of flooding during the growing season, and slope generally from 0 to 5 percent (USDA NRCS, 1995). For more information on prime and unique farmlands see: [http://www.access.gpo.gov/nara/cfr/waisidx\\_99/7cfr657\\_99.html](http://www.access.gpo.gov/nara/cfr/waisidx_99/7cfr657_99.html).
- “Erodible land” is defined by the Sodbuster, Conservation Reserve, and Conservation Compliance parts of the Food Security Act of 1985 and the Food, Agriculture, Conservation, and Trade Act of 1990. Determinations for highly erodible land are based on an erodibility index as defined in the *National Food Security Act Manual*. Policy and procedures for developing and maintaining highly erodible land are given in Part 511 of the manual: ([ftp://ftp.tx.nrcs.usda.gov/NHQ/programs/Appeals%20Training/FSANRCS\\_NAD\\_POLICY/NFSAM\\_HEL\\_common.pdf](ftp://ftp.tx.nrcs.usda.gov/NHQ/programs/Appeals%20Training/FSANRCS_NAD_POLICY/NFSAM_HEL_common.pdf)).

The Proposed Actions would comply with established Division of Forestry and Air Force resource management plans and instructions (e.g., EAFBI 13-212, Range Planning and Operations, Chapter 7 – Environmental Management). These documents include planning goals and activity directives relating to the management of earth resources and practices to minimize and mitigate impacts.

#### 3.6.1.2 Assessment Method

The assessment entailed evaluating impacts from the Proposed Action to earth resources on BRSF and THSF. The assessment focused on potential physical and

chemical damage to geology and soils and subsequent impacts to water resources, such as sedimentation from accelerated soil erosion and/or water contamination.

*Physical damage* includes disturbances to the structural and/or biological properties of soil or geologic features that compromise their natural condition and function. Examples include compaction, rutting, accelerated (human-induced) soil rill and gully erosion, and generation of dust or mud. *Chemical damage* occurs when resources are chemically or biologically altered due to the introduction of organic and inorganic materials (e.g., contamination of soil and geologic features from chemical fluid leaks or spills).

*Soil erosion* is a three-phase process of detachment, transport, and deposition of surface materials by water flowing over land. Erosion is difficult to control and easily accelerated by humans. Accelerated erosion caused by humans occurs at rates much greater than under natural erosion conditions. Large quantities of eroded soil sediment delivered to streams can adversely affect channel morphology, degrade aquatic species habitats, and impair water quality. Such sedimentation increases water column turbidity, alters water chemistry parameters, and introduces chemical contaminants and other pollutants.

## **Geologic Resources Addressed**

### ***Karst Terrain***

Karst terrain is formed by the dissolution (chemical solution) of underlying soluble carbonate rocks—primarily limestone and dolomite—by surface water and/or ground water. This unique landscape is characterized by rapid permeability, as water flows through interconnected subsurface voids. As weakly acidic stormwater migrates through soils and rock fractures, it dissolves bedrock materials, creating solution pipes, cavities, caverns, and sinkholes. Karst sinkholes occur when cavities, caverns, and/or solution pipes cause the collapse of overburden materials into subsurface voids, creating depressions that can range from a few feet to hundreds of feet in diameter. Because of their high permeability and lack of a natural filtration system, karst areas are particularly vulnerable to pollution. In northwest Florida, sensitive karst terrain frequently serves as recharge for the Floridan aquifer system. Thus, pollution of karst areas could expose drinking water aquifers to contamination (NFWFMD, 2010b; Southwest Florida Water Management District, 2007; Tihansky and Knochenmus, 2001; Lane, 1986).

### ***Closed Depressions***

A closed depression is a landform where the hill slopes encircle a common sediment depository, and the sediment eroded from the surrounding hill slopes is trapped in the system. These ground depression sinks function as reservoirs for stormwater runoff and groundwater seepage and may hold water for extended periods of time.



## Soil Resources Addressed

### Soil Inventories

Soils were inventoried for Proposed Action locations; highly erodible, potentially highly erodible, and hydric soils (associated with wetlands and floodplains) are identified.

Some shallow gradient terraces, flats, depressions, and floodplain wetlands that exhibit fluctuating near-surface water tables and/or frequent-to-occasional flooding exhibit wet soil conditions are classified as hydric soils. These soils are under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (lacking oxygen) conditions in the upper part (USACE, 1987) (see photo of Wetland Hydric Soils). Due to fluctuations in surface and subsurface hydrology, some hydric soils may have nonhydric phases. Hydric soils are used as an indicator to identify and classify jurisdictional wetlands (see Section [5.7.1](#)).



**Wetland Hydric Soils** (Photo by Mike Rainer)

In addition, prime farmland areas were identified. Timber production qualifies as farmed land under the Farmland Protection Policy Act (see Section [3.6.1.1](#), *Regulatory Drivers*), whereas urban areas or built-up land of 10 acres or more are not considered prime farmland.

### Erodible Soils

The Natural Resources Conservation Service estimates which soils are highly erodible or potentially highly erodible due to sheet and rill erosion. These estimates are primarily based on the Revised Universal Soil Loss Equation (RUSLE). This model utilizes soil, topography, rainfall, and land cover management variables to predict soil erodibility. A “highly erodible” soil has a maximum potential for erosion that equals or exceeds eight times the tolerable erosion rate. In addition to the dominance of sandy soil, extensive areas that are moderately to steeply sloped strongly affect the erodibility of forest soils.

Soil erodibility is only one component of the soil erosion process. The disturbance or loss of vegetative cover determines the extent to which erodible soils become erosive and exhibit sheet, rill, and/or gully features that can generate and transport sediment. Depending on site variables, sediments may remain on-site or be transported great distances.

### Natural Soil Erosion Sources

Natural erosion sources are those that occur as part of natural processes. Human interaction tends to accelerate or exacerbate natural erosion processes.

### Streambanks

Under natural conditions, streambank instabilities occur as a result of channel entrenchment and scouring of bendway cutbanks. Bank retreat primarily results from mass failure of overheightened and oversteepened banks. Scour of the riverbed and bank toe increases the bank height and slope angle, decreasing its stability. Noncohesive bank materials, such as sandy soils, tend to fail from bank slides and sloughing as the soil particles lose their shear strength because of saturation. Site-specific failure mechanisms depend on the topography (height and steepness) and stratigraphy of the bank and the physical properties of the bank soils (Shields et al. 1995).

Sources of streambank instabilities include highly permeable and erodible characteristics of sandy geologic formations and human-induced sedimentation associated with land uses such as silviculture, borrow pits, unpaved road crossings, and other activities (Hollie et al., 2010). Heavy sediment loading of streams can reduce channel depth, which can widen the stream and increase channel flows, putting greater pressure on streambanks and resulting in accelerated bank erosion. Unstable streambanks are also sensitive to human ingress and regress activities that could increase soil loss.

### Steepheads

*Steepheads* are self-sustaining ecosystems created from the bottom up by a process known as “spring sapping.” These springs give rise to many small streams and create small box canyons that are notched into the edges of the flat uplands. Their formation begins with valley-head soil erosion at the point of groundwater discharge, followed by headwall slumping that creates a semicircular box canyon configuration. The sandy clays near the surface remain vertical, while the underlying softer sands near the spring wash away. Typically, northwest Florida steepheads range from 50 to 70 feet deep and 100 to 200 feet wide and have side slopes with gradients exceeding 50 percent (Photo: Steephead Box Canyon Slopes).



**Steephead Box Canyon Slopes**

(Photo by Mike Rainer)

Because of their steep slopes, steephead canyons are highly susceptible to human-induced surface erosion. As exemplified in the photos below (*Eroded Steephead Slopes, Santa Rosa County, Florida 1930 and Okaloosa County, Florida, 2005*), ground disturbances that remove vegetative cover and/or concentrate surface runoff can cause catastrophic gully erosion that may damage or destroy these unique ecosystems.



**Eroded Steephead Slopes, Santa Rosa County, Florida, 1930** (State Archives of Florida) **and Okaloosa County, Florida, 2005** (Photo by Mike Rainer)

### Gulf Coastline Erosion

Beach erosion (shoreline retreat) and sediment accretion (shoreline advance) are ongoing natural processes along the Gulf of Mexico coastline. The dynamic coastal environment of beaches and sand dunes is subject to drastic changes, particularly during tropical storms and hurricanes. During these events, extensive amounts of soil materials are subject to suspension, transport, and deposition by high winds, storm surge, tides, waves, and nearshore circulation. In extreme cases, enough beach sand may be eroded to expose ancient tree stumps.

### ***Accelerated Soil Erosion Sources***

Accelerated erosion sources are those that result from human interaction with earth resources.

### Borrow Pits

Borrow pits are open mines used primarily as sources of sand and clayey materials for unpaved road maintenance and reconstruction (Hollie et al., 2010). These pits are potential sources of severe soil erosion and sedimentation. This fact is due to their state of perpetual surface disturbance, bare surface conditions, common location in proximity to waterways, accumulations of loose soil materials, and exposure of relatively impervious soil layers.

### Unpaved Roads and Crossings

Places where roads cross streams and wetlands are representative of human imprinting on the landscape and the resulting impacts on natural resources. In particular, unpaved roads and crossings severely impact aquatic ecosystems. Crossings allow contaminants and sediments suspended in stormwater runoff to discharge directly into receiving waters. Sedimentation caused by unpaved road crossings can result in violations of environmental laws governing water quality, listed species, and their habitats. In some cases, impacts from such sedimentation are catastrophic to aquatic ecosystems.

[Table 3-31](#) defines how the impact attributes of context, intensity, and duration are applied to earth resource analyses.

**Table 3-31. Definitions of Impact Attributes for Earth Resources**

Attribute	Earth Resources
<b>Contexts Analyzed</b>	
Regional	Sediment generated by the disturbance source rill and/or gully erosion features is discharged off-site onto adjacent land areas, water bodies, and/or watershed streams, and/or karst disturbance creates a subsidence closed depression or sinkhole incident that could adversely impact basin- or subbasin-level hydrology.
Localized	Soil damage alters surface/geohydrology patterns; sediment generated by sheet/rill erosion remains on-site in close proximity to the disturbance source and is not discharged into water resources, and/or impacts to hydrology from karst disturbance are limited to the immediate watershed area.
Site-specific	Soil compaction/rutting damage, erosion and sediment, and/or karst area disturbances would affect a relatively small area, may not affect the immediate surroundings, and would not extend beyond the site of disturbance.
<b>Intensity (can be either adverse or beneficial)</b>	
High	Impact site disturbances are extensive: (1) prominent areas of compacted/rutted soil and/or gully features would deliver sediment off-site that may smother terrestrial vegetation or is discharged into water resources, a violation of state and/or regulations; (2) physical damages would alter existing karst topography and geohydrology and could lead to the development of closed depressions or sinkholes; and/or (3) soil contamination would create toxic site conditions and contaminants would likely move off-site and/or into groundwater. Mitigations are required to avoid impact effects.
Medium	Impact site exhibits any or all of the following: (1) Prominent area(s) of compaction/rutting and/or gully features are present; however, generated sediment primarily remains on-site. (2) Disturbance would alter existing karst area surface and surface landform topography. (3) Soil contamination would alter soil chemistry and diminish soil productivity and/or biology. Mitigations may be required to avoid impact effects.
Low	Impact site exhibits: (1) soil compaction/rutting damage and/or sheet/rill erosion features are present but would quickly stabilize or be mitigated by on-site personnel or consultations with regulatory agencies; (2) karst area disturbances would be limited to the surface and would not alter existing karst topography or geohydrology; and/or (3) contamination may affect soil biology, but soil chemistry and productivity would not be altered. Constraints and/or mitigations may be required.
Neutral	Impact site exhibits: (1) small areas of ground disturbance and the effects of erosion are imperceptible; no distinguishable erosion features would form; (2) site disturbance would not affect or alter existing karst topography or geohydrology; and/or (3) soil contamination would not alter site soil chemistry, biology, or productivity. No mitigations are required.
<b>Duration</b>	
Long term	Effect of gully soil erosion features and/or karst area disturbance and contamination effects would persist for the duration of the program or beyond.
Medium	Effect of rill and/or gully soil erosion features and karst area disturbance and contamination effects would stabilize within months to years.
Short term	Effect of sheet and/or rill soil erosion features and karst area disturbance would stabilize within weeks to months.

### 3.6.1.3 Impact Levels

The level of impact associated with earth resources and the impact's potential significance is determined by considering how Proposed Action effectors could interact with earth resources in terms of context, intensity, and duration as described in [Table 3-31](#). [Table 3-32](#) explains the impact level categories for earth resources analyzed in this EIS and identified in Chapters 4, 5, and 6.



**Table 3-32. Impact Level Categories for Earth Resources**

Attributes	Earth Resource Impact Evaluation Criteria
Adverse	Adverse impacts to earth resources may result in physical and chemical damage to geology and soils and subsequent impacts to water resources, such as sedimentation from accelerated soil erosion and/or water contamination. The level of impact would be directly related to the impact attributes described in <a href="#">Table 3-31</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration when the effect(s) are only partially reversible or irreversible with mitigation. Insignificant impacts may occur under medium- to low-intensity scenarios of short duration where disturbances would be limited to the surface and soil chemistry and productivity would not be altered. Impact effects could be reversed with appropriate mitigation measures.
Neutral/no effect	Ground disturbances would be limited to small areas with imperceptible erosion. Karst topography, geohydrology, and/or site soil chemistry, biology, or productivity would not be altered or affected.

### 3.6.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to earth resources. The proposed emitter sites are located on existing developed sites that have established access and operational utilities. Expenditure of EMR and entry, positioning, and removal of mobile radar equipment would have no impact on earth resources. There may be site-specific, neutral land development and point disturbance impacts associated with tree clearing and installation of fencing at some locations. However, any land development activities may potentially occur at only two sites and would be less than half an acre in size. The scope of potential land development activities at these sites would be minor, and insignificant. Emitter site activities have little potential to impact public health or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for site-specific analysis in Chapter 4.

### 3.6.3 General Training Activity Impact Assessment

Point impacts, consumption, and incidental land disturbance would have no adverse impact on soils. Point impacts and ISD could increase the potential for soil compaction and accelerated soil erosion. It is anticipated that physical damage impacts to earth resources associated with point impacts and ISD would be insignificant, unlikely, short-term, site-specific, and neutral. Consumption activities would result in negligible site-specific physical damage to earth resources. Digging would be limited to point impact removal of individual plant roots by training personnel. Disturbances from point impacts, ISD, and consumption would be expected to recover naturally. LZ activities would utilize sites previously cleared by the FFS and would not be expected to have an adverse impact on soils. These activities are not addressed further in the analysis.

#### Land Disturbance

Under the Proposed Action, LZs/DZs could potentially be established anywhere in the forests, with subject to the constraints and mitigations identified in Sections [2.5](#) and [2.7](#). Under Subalternative 1, LZ/DZ use at BRSF would entail utilization of 13 identified locations, and at THSF three already established FFS LZs, which are currently used for aircraft landings, are proposed for use. Under either scenario, there would be no land clearing or development/disturbance associated with establishing an LZ/DZ – these



locations would be comprised of sites identified by the FFS as already cleared and suitable for use as an LZ/DZ.

Proposed LZ/DZ-based aircraft landing activities include A/LVL and LLLHI/Es training at existing cleared areas, primarily clearcuts, in various locations at both forests (see Section [2.3.2.1](#)). All forest tactical areas are candidate locations. No landing strips, helicopter pads, or other construction activities would be required to prepare selected sites. For safety and operational reasons, aircraft landings would take place on relatively level ground that is less prone to unstable soil conditions and soil erosion than steeper sites. Potential impacts to earth resources include soil compaction, rutting, and erosion.

Clearcuts often exhibit extensive coverage by young vegetative growth, woody debris, slash, and near-ground-level tree stumps for several years after harvesting. If root raking is not conducted in preparation for replanting, ground stabilizing root systems of woody trees and shrubs generally remain intact. The type and density of organic matter varies between site locations and generally depends on the pre-harvest timber basal area, available seed sources, soil productivity and bulk density, and post-harvest management practices. As needed, the FFS implements silviculture BMPs to repair damaged areas, improve soil stability, and promote plant growth following timber harvesting.

## Ground Movement

### *Wheeled Vehicles*

All wheeled-vehicle movements would be conducted on existing roads within all use areas with noted general and site-specific constraints and mitigations identified in Sections [2.5](#), [2.7](#), and [3.6.4](#), respectively. Therefore, no impacts to off-road areas would occur. The stabilized asphalt and concrete surfaces of paved roads would not be adversely impacted by mounted troop vehicle movements; therefore, they were excluded from further analysis.

Proposed use of unpaved roads and crossings could degrade and destabilize unpaved road soil or aggregate surfaces, which could increase soil erosion and sedimentation. However, the proposed mission frequency of three training events per quarter would likely not exceed the carrying capacity of available unpaved roads or be greater than the current level of vehicle use. Both forests use standard unpaved road and roadside best management practices (BMPs) to repair and stabilize roads (FDACS, 2013).

Vehicle traversing of low-water crossings could destabilize road approach slopes and increase soil erosion. Based on available evidence, most low-water crossings at BRSF are unimproved; where improvement does occur, it likely is limited to lining the streambed with rocks. In some cases, the section of the road close to the stream may be amended with gravel or crushed rock to reduce soil loss and road degradation. Because of stream proximity, road bank soils dislodged by vehicle wheels could readily enter the waterway as sediment. Generally, the potential sources of sediment are limited to the portions of the road in immediate contact with the water course and the distance of road slopes from the gradient crest to the stream. Driving through a stream also mobilizes streambed sediments.

Incidental engine and equipment leaks may also occur during normal operations. Introduction of fuels into the soil could contaminate the soil and groundwater. Such contamination could create soil conditions toxic to vegetation, both in establishment and growth. Subsequent loss or decreased vigor of vegetative cover could increase soil susceptibility to ground disturbance (erosion, compaction, and/or rutting). Contamination of water resources and impacts from hazardous materials are discussed in Sections [5.7.2](#) and [5.12.2](#), respectively.

Although spills and leaks could occur, it is anticipated that these incidences would be rare. Best practices to prevent and rapidly respond to spills, as outlined in the *Eglin Air Force Base Oil and Hazardous Substance Contingency Plan*, would be implemented during training activities to reduce impacts.

### ***Dismounted Movement***

Dismounted troop movements include on-and off-road maneuvers and bivouac, hardened camp, and assembly area field operations associated with CCDM, B/AA, HCSU, and TCSA. During CCDM training, troops move on foot cross-country, whereas the other three training events involve troop movements within temporary or established camps.

Under the Proposed Action dismounted movement may occur in all use areas (except prohibited and restricted use areas), with noted constraints and mitigations identified in Sections [2.5](#), [2.7](#), and [3.6.4](#), respectively (e.g., establishment of bivouac areas utilizing tent stakes may only occur in LU- 2 areas). All tactical areas are potentially affected by dismounted troop movements.

Under Subalternative 1, B/AA would not occur at either forest. At BRSF ground movement would be limited to immediate areas surrounding identified LZs/DZs, hardened camp sites and the movement corridor between Blackwater Airfield and the STOP Camp; at THSF there would be no difference from the Proposed Action.

Ground disturbance or trampling during troop movement can result in soil compaction, increasing soil bulk density (reduced soil pore space), decreasing rate of water infiltration into soil, increasing stormwater runoff and soil erosion potentials, and reducing vegetation germination and growth. As activity becomes concentrated into smaller areas, the potential for soil damage tends to increase. Numerous investigations of recreational sites have found that concentrated foot traffic can significantly increase soil bulk density. As with vehicles, soil damage is most severe under wet soil conditions (Whitcotton et al., 1999; Whitcotton et al., 2000). Reduced infiltration rates are one of the most detrimental consequences of trampling-induced soil compaction (Cole, 1982). Studies have shown that trampling impacts are generally most prevalent in the upper 6 inches of soil (Whitcotton et al., 2000). Use of developed recreational camp sites can result in the loss of soil protecting ground cover and initiate transitions to disturbance-tolerant plant communities (LaPage, 1967).

Based on the anticipated number of troops, extent of available area, and intensity of trampling, bivouacs and assembly areas, combat support areas, and hardened camp sites are rated as low- moderate-, and high-use activities, respectively. Except for hardened sites, the location of camp sites could change as needed. For all but the hardened camp sites, disturbances would be limited to driving tent stakes into the

ground; no other digging or ground disturbance would occur. Since hardened camp facilities have previously been constructed, no additional ground disturbances are anticipated. During cross-county maneuvers, soldiers could move through wetlands and/or cross streams and would likely use established roads and trails as needed. All support vehicles would remain on designated roads.

*Dismounted Troop Movements Determination:* Troop movements would impact forest soil and/or geologic resources. Impacted areas would likely exhibit increased soil bulk densities and reduced infiltration that could increase soil erosion. Under the Proposed Action and Subalternative 1 it is anticipated that:

- Cross-country maneuver impacts would be adverse, probable, short term, site specific, neutral, fully reversible, and insignificant.
- Temporary low-use bivouac and assembly area impacts would be adverse, unavoidable, short-term, low intensity, fully reversible, and insignificant.
- Temporary moderate-use TCSA impacts would be adverse, unavoidable, medium term, localized, fully reversible, and insignificant. Soil compaction impact mitigations may be required for moderate-use camp sites (see Section [3.6.4](#)).
- Permanent, high-use hardened camp site impacts would be adverse, unavoidable, medium-term, localized, fully reversible, and insignificant. Since these are permanent, maintained facilities, no additional mitigations would be required.

The U.S. Department of Agriculture, Natural Resources Conservation Service has developed a system to rate the suitabilities and limitations for establishing bivouac areas. The interpretation identifies topographic and soil properties that affect the ease of establishing bivouac sites. In developing bivouacs, slope, soil properties, wetness, and depth to cemented soil pans are primary concerns:

- *Not limited* – The soil has features very favorable for the specified use; good performance and very low maintenance can be expected.
- *Somewhat limited* – The soil has features that are moderately favorable for the specified use. Limitations can be overcome or minimized by special planning, design, or installation procedures; these are associated with LU-2 areas.
- *Very limited* – The soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected; these are associated with Prohibited, Restricted, and LU-1 areas.

Constraint areas where mission impact-induced earth resource effects are most likely to occur include closed depressions, steepheads, and hydric and erodible soils. Steepheads and closed depressions represent locations where steep slopes and sustained wet soil conditions are sensitive to soil disturbances from troop movements.

These would mostly likely occur. Recommendations to minimize impacts to earth resources are presented in Section [3.6.4](#).

### Expendable Use

For comparative analysis, the proposed mission impacts of expendable use on earth resources were examined against those detailed in the *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c). Based on the similarity between the types and number of expendables, it is anticipated that earth resource impacts from exposures to the munitions expenditures under the Proposed Action and Subalternative 1 would be insignificant, possible, short-term, site-specific, and neutral; potential Subalternative 1 impacts would be less in scope than the Proposed Action due to reduced frequency, intensity and location of use. Therefore, munitions use has not been carried forward for further site-specific analysis.

### Aircraft Operations

During training events, aircraft landing wheels or struts would rest on the surface and disperse the full weight of the aircraft at these contact points. Depending on the aircraft, the fully loaded weight can range from a few thousand to tens of thousands of pounds. For comparison, the loaded weight of a loaded CV-22 Osprey is approximately 47,500 pounds and the operational weight of a wheeled logging skidder ranges from 45,500 to 51,500 pounds.

During LZ/DZ, A/LVL, and LLHI/E aircraft landings, soil compaction or rutting could occur at the aircraft wheel or strut ground contact points. The extent of soil damage from compaction or rutting would increase under wet soil conditions (Xu et al., 1999), particularly in areas with hydric soils where seasonal high water tables are near the surface. Low soil moisture content is likely instrumental in reducing soil compaction. Under comparable conditions, silt and clay soils generally compact more severely than sandy soils (Amup, 1998).

The infrequent occurrences and distribution of aircraft landing events at various forest locations under both the Proposed Action and Subalternative 1 would minimize repeated impacts at site-specific contact points. Accounting for soil trafficking impacts associated with timber clearcut logging, aircraft landing-induced disturbances would not be considered detrimental. Landing site damage would likely recover through natural attenuation, and site vegetative cover and soil productivity would likely not be diminished. After about five years, the density and height of woody vegetation of some sites may hamper performance during some training activities, and troops may stop using these sites.

Mission-related impacts to earth resources are more likely in certain constraint areas. Such areas include closed depressions, steepheads, and hydric and erodible soils. These areas represent locations where steep slopes and sustained wet soil conditions are most sensitive to soil disturbances from landings. Recommendations to minimize constraint area impacts are presented in Section [3.6.4](#).

In extreme cases, structural damage to soils may occur. This damage requires intervention to accelerate site recovery from rutting, encourage revegetation, and prevent erosion. This uncommon condition may occur during landings of fully-loaded aircraft during wet periods when the surface soil is saturated or on hydric soils when water tables are within 6 inches of the surface. Determinations of damage requiring site repair would be made by on-site personnel.

Land suitabilities and limitations in terms of “Not Limited,” “Somewhat Limited,” and “Very Limited” for LZs/DZs are the same as those identified previously under Dismounted Movement. The interpretation identifies topography, soil properties, and flooding or ponding that may restrict the periods when the LZ could be used.

### **Amphibious Operations**

Under the Proposed Action boat and troop egress and ingress activities would occur along the banks and shorelines of available training areas within all use areas (except prohibited areas and RAs), at sites designated by the GLI Liaison and the FFS. Activities would occur subject to the General Operational Constraints discussed in Section 2.5. During training events, foot traffic and movement of boats in and out of the water would be concentrated in a relatively small area at the water edge. AO could disturb soils and trample vegetation, resulting in conditions that may result in accelerated bank erosion. Whether over natural ground or constructed boat launch, areas repeatedly used would be more prone to exhibit adverse effects on soils. In shallow areas, boat operations can also disturb bank and stream bottom sediments, thereby increasing water column turbidity.

On streambanks and shorelines with established vegetation and stable grades (not overheightened or oversteepened), impacts would consist of minor disturbances that, in most cases, would naturally recover. Operations conducted at hardened boat launches would not likely increase streambank degradation or soil loss.

Under Subalternative 1 amphibious operations would not occur in either forest.

#### **3.6.3.1 General Training Activity Impact Assessment Summary**

Based on the scope of action described in Chapter 2, all training activities except for OHO would have at least some interaction with earth resources. Table 3-33 identifies potential interactions between Proposed Action effectors and earth resource receptors carried forward for detailed analyses in Chapters 5 and 6 (highlighted yellow). Activities shaded in green have little potential to impact public health or the human and natural environment or little potential to result in violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters 5 and 6.



**Table 3-33. Receptor and Effector Interactions for Earth Resources**

Effector	Earth Resource Area Potentially Affected (Receptor)
<b>Land Disturbance</b>	
Land development	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No construction or land development activities would be conducted to modify or otherwise reinforce proposed LZs/DZs or existing unpaved roads. There would be minimal ground disturbance associated with potential fence installation at a few of the proposed emitter sites. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.
Point impacts	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for soil compaction and accelerated soil erosion. It is anticipated that physical damage impacts to earth resources associated with point impacts and ISD would be insignificant, unlikely, short-term, site-specific, and neutral. <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity. Impact potentials associated with identified LZs/DZs ( <a href="#">Table 2-2</a> ) and BRSF movement corridor.
Incidental surface disturbance	
Consumption	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> It is anticipated that physical damage to earth resources would be insignificant, probable, short-term, site-specific, and neutral. Digging would be limited to point impact removal of individual plant roots by training personnel. for impact less than the Proposed Action given the reduced level of proposed activity. <b>Subalternative 1:</b> This activity would not occur; consequently there would be no impact.
<b>Ground Movement</b>	
Wheeled vehicles	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> This issue area has been carried forward for site-specific analysis. Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Additionally, soil/water contamination from fuels and other materials on roadways and in parking areas.
Dismounted maneuver	<b>Potential for soil compaction and accelerated soil erosion associated with ISD under both the Proposed Action and Subalternative 1.</b> This issue area has been carried forward for site-specific analysis.
<b>Use of Expendables</b>	
Blanks/GBS	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> For comparative analysis, the proposed mission impacts of expendable use on earth resources were examined against those detailed in the <i>Interstitial Area Range Final Environmental Assessment Revision 2</i> (U.S. Air Force, 2013c). Based on the similarity between the types and number of expendables, it is anticipated that earth resource impacts from exposures to the munitions expenditures under the Proposed Action would be insignificant, possible, short-term, site-specific, and neutral. <b>Subalternative 1:</b> Same as Proposed Action with potential impacts considerably less given reduced frequency and location of expendable use (only BRSF hardened camp sites).
Smoke grenades	
Other/equipment	No adverse impacts identified; this issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There are potential impacts from leaks and spills while handling fuels. However, implementation of required spill control and response procedures would minimize this potential (see Section <a href="#">3.12</a> , <i>Solid and Hazardous Materials/Waste</i> ). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.
Aircraft Operations	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> The potential for adverse impacts has been identified associated with soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff and refueling activities. This issue area has been carried forward for site-specific analysis.
Amphibious Operations	<b>Proposed Action:</b> The potential for adverse impacts has been identified associated with accelerated soil erosion along streambanks from ingress/egress along shorelines. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with earth resources. <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.

DZ = drop zone; ISD = incidental surface disturbance; LZ = landing zone

### 3.6.4 Proposed Resource-Specific Mitigations

Based on the general impact analysis presented in Section [3.6](#), the following Proposed Resource-Specific Mitigations have been identified to further minimize potential impacts to earth resources:

- Utilize sites that are best suited to the intended activity and avoid areas with known constraints or limitations.
- Temporally and spatially disperse LZ/DZ training to minimize repetitive use impacts to landing zone surface conditions and maximize life cycles. Utilize mission logistics information to plan training events that avoid, to the degree possible, LZ/DZ areas used during the previous two years. A rest period would promote vegetative growth and allow disturbed areas to recover.
- Inspect LZs/DZs following each training mission. Coordinate immediate repairs of damaged areas.
- As needed, install BMPs to minimize soil disturbances (FDACS, 2008; USACOE, 2004; USACOE, 2008). For sites with extreme rutting damage, physically amend damaged soils with tillage equipment after the soils have dried. Depending on extent of damage, soil structure amendments could be made with hand tools or motorized tillage equipment. Areas may also need to be reseeded to native species to reduce bare ground and encourage the establishment of soil protecting ground cover.
- Avoid LZ/DZ areas with highly and potentially highly erodible soils and hydric soils. Soil erosion potentials increase with increasing soil erodibility and wet soil are highly sensitive to damage by compaction and rutting.
- Maintain at least a 100 foot exclusion buffer around sensitive steephead slopes and closed depression subsidence areas to prevent accelerated soil erosion of slopes and wet soil rutting.
- As necessary, install temporary metal landing mats for LZ/DZ landing training activities conducted in wet areas during poor weather conditions. Mats can reduce potentials for soil damage and provide stable platforms aircraft landings, materials and personnel loading and unloading, and temporary storage.
- To the degree possible, utilize established walking trails or designated roads during cross county dismounted maneuvers.
- Avoid cross county maneuvers through steephead locations. The steep to very steep slopes of these geologic features are highly prone to accelerated rates of erosion if disturbed. These areas are within LU-1 areas and would be identified by the L.I.T.
- Avoid the use of borrow pits for temporary campsites. For some pits, additional surface disturbances could increase soil erosion rates or affect the stability of early-stage pit reclamation.
- Avoid establishing temporary camps within or in proximity to steepheads and closed depression areas. These sites may be sensitive to increases in

stormwater runoff of disturbances associated with camp activities. An exclusion zone of at least 100 feet is recommended. These areas are within LU-1 areas and would be identified by the L.I.T.

- Avoid sensitive streambank areas that are overheightened and oversteepened and/or areas exhibiting bank scour and mass failure features. These areas are within LU-1 areas and would be identified by the L.I.T.
- To the degree possible, avoid the repetitive use of the same egress and ingress locations within the same year for AO.
- For sites where vegetation damage could result in loss of plant cover, reseed with native species to encourage the reestablishment of vegetative cover.

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### 3.7 WATER RESOURCES

Water resources include surface waters, ground water, wetlands, and floodplains. Each water resource is referred to as a “receptor.”

#### Surface Water

Surface waters are any waters that lie above ground water, such as streams, springs, ponds, lakes, rivers, bayous, and bays. Most of the streams in the GRASI region are classified as seepage streams, or blackwater streams. Seepage streams are clear to lightly colored and originate from shallow ground water that has percolated through deep, sandy, upland soils. Blackwater streams are nutrient-poor streams that characteristically have tea-colored waters laden with tannins, particulates, and dissolved organic matter and iron from swamps and marshes that feed into the streams. Base flow in most streams originates from shallow ground water discharge. Most rainfall quickly infiltrates the porous, sandy soils in the area with little, if any, surface runoff.

#### Ground Water

Ground water includes the subsurface water resources and is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Aquifers may be unconfined (open to the surface) or confined (separated from the surface by impermeable layers of rock or sediments). Unconfined aquifers are generally more susceptible to contamination from surface spills. Although overall water quality in northwest Florida is quite good, non-point source pollution from agriculture, silviculture, and construction runoff is a growing concern (FDEP, 2001; FDEP, 2002; FDEP, 2004).

#### Wetlands

Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (Mitsch and Gosselink, 1993). The term “wetlands” describes marshes, swamps, bogs, and similar areas. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal communities found in wetland areas (USEPA, 2003).

## Floodplains

Floodplains are lowland areas adjacent to surface water bodies (e.g., rivers, lakes, and wetlands), where flooding events periodically cover low-lying areas with water. Floodplain vegetation and soils act as water filters, intercepting surface water runoff before it reaches lakes, streams, or rivers, and store floodwaters during flood events. This filtration process aids in the removal of excess nutrients, pollutants, and sediments from the water.

### 3.7.1 Impact Assessment Methodology

The impact assessment for water resources evaluates the potential impacts of the Proposed Action effector impacts to water resources. Impacts to water resources are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

#### 3.7.1.1 Regulatory Drivers

Regulatory drivers affecting water resources include a number of federal laws, Air Force-specific regulations and instructions, state laws, and Eglin AFB instructions and policies. [Table 3-34](#) summarizes the most important regulatory drivers affecting water resources that could be affected by the Proposed Action.

**Table 3-34. Relevant Laws, Regulations, and Policies: Water Resources**

Law or Regulation	Citation	Summary
<b>Federal</b>		
Federal Water Pollution Control Act/Clean Water Act (FWPCA/CWA)	33 USC 1251 et seq.; 1997	In addition to regulating navigable water quality, the CWA establishes NPDES permit program for discharge into surface waters and stormwater control; USACE permit and state certification for wetlands disturbance; regulation of ocean discharge; sewage wastes control; and oil pollution prevention. Includes Dredged or Fill Permit Program; Section 404 regulates development in streams and wetlands by requiring a permit from the USACE for discharge of dredged or fill material into navigable waters. A Section 401 water quality certification is required from the state as well.
Safe Drinking Water Act (SDWA)	42 USC 300f et seq.; 1997	Requires the promulgation of drinking water standards, or maximum contaminant levels, which are often used as cleanup values in remediation; establishes the underground injection well program; and establishes a wellhead protection program.
Floodplain Management	Executive Order 11988; 24 May 1977	Directs federal agencies to restore and preserve floodplains by performing the following in floodplains not supporting development: evaluating effects of potential actions; allowing public review of plans; and considering in land and water resource use.
Protection of Wetlands	Executive Order 11990; 24 May 77	Requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in their activities. Construction is limited in wetlands and requires public participation.
<b>State</b>		
Florida Aquatic Preserves Act	F.S. Chaps. 253, 258	Establishes state aquatic preserves.

**Table 3-34. Relevant Laws, Regulations, and Policies: Water Resources, Cont'd**

Law or Regulation	Citation	Summary
Environmental Resource Permit Program and Sovereign Submerged Lands Program	F.S. Chap. 373; FAC Chap. 62-330	Establishes a comprehensive state regulatory program that regulates most land (uplands, wetlands, and other surface waters) alterations of the land.
Florida Air and Water Pollution Control Act	F.S. Chap. 403, Part I	Establishes the regulatory system for water resources, including wetlands in the state of Florida.
Surface Water Quality Standards	FAC Chap. 62-302	Classify Florida surface waters by use. Identify Outstanding Florida Waters
Florida Dredge and Fill Activities	FAC Chap. 62-312	Requires a state permit for dredging and filling conducted in, on, or over the surface waters of the state.
Aquifer Protection Program	FAC Chapter 62-520	Establishes the basis for prevention of ground water contamination; also provides ground water permitting and monitoring requirements.
<b>Eglin Air Force Base</b>		
Eglin Air Force Base Range Planning and Operations	Eglin Air Force Base Instruction 13-212, Chapter 7 Environmental Management	Outlines the general requirements in support of natural resources, cultural resources, and waste management. Compliance with the requirements in this chapter will help maintain quality environments for future testing and training missions and avoid mission delays.
<b>Air Force</b>		
Air Force Policy Directive 32-70; 20 July 1994; Environmental Quality		Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Clean Water Act, Safe Drinking Water Act, and Water Quality Act of 1987.
Air Force Instruction 32-7041; 10 December 2003 (Eglin Supplement, 16 June 2010); Water Quality Compliance		Instructs the Air Force on maintaining compliance with the CWA; other federal, state, and local environmental regulations; and related DoD and Air Force water quality directives.
Air Force Instruction 32-7064; 22 July 1994; Integrated Natural Resources Management		Sets forth requirements for addressing wetlands, floodplains, and coastal and marine resources in an integrated natural resources management plan for each installation.

DoD = Department of Defense; FAC = Florida Administrative Code; F.S. = Florida Statutes; NPDES = National Pollutant Discharge Elimination System; USACE = U.S. Army Corps of Engineers; USC = United States Code

### 3.7.1.2 Assessment Method

Users of the Eglin Range observe procedures in EAFBI 13-212, which incorporates appropriate conservation measures but also ensures environmental stewardship in relation to training missions. As part of the Proposed Action, the measures in EAFBI 13-212 would be observed during GLI training activities. For purposes of this EIS, analysis of impacts to water resources assumed that avoidance measures in EAFBI 13-212 would be observed and properly implemented as part of the Proposed Action. If necessary, additional potential mitigations or impact minimization measures were identified as part of the analysis.

The impacts analysis assessed the potential for the Proposed Action to interact with known water resources at BRSF and THSF. The impact from these interactions may be direct, indirect, or if combined with other actions, cumulative. To inventory the water resources at BRSF and THSF, the Air Force accessed information from the state and federal agencies with regulatory oversight and/or resource management responsibility for these resources. Each of the previously identified water resources categories may



be impacted differently by one or more of the proposed training activities. There are also specific regulations that must be considered for analyzing impacts to water resources.

The Air Force has conducted a Coastal Consistency Determination in accordance with the Coastal Zone Management Act (see Appendix C, *Consultation Documentation*), with a finding that the Proposed Action is consistent with the Act and its provisions. The State of Florida will review the Coastal Consistency Determination as part of the NEPA process; any correspondence received in this regard will be included in the Final EIS.

[Table 3-35](#) defines how the impact attributes of context, intensity, and duration are applied to water resource analysis.

**Table 3-35. Definitions of Impact Attributes for Water Resource Categories**

Attribute	Surface Water	Ground Water	Wetlands	Floodplains
Contexts Analyzed				
Regional/population	County level, state park level, or management unit level effects; impacts to populations			
Localized	Less than management area effects; impacts to individuals			
Intensity (can be either adverse or beneficial)				
High Extensive mitigations required to minimize or avoid adverse impacts; scope of mitigations based on context and duration of the impact.	Substantive change in water quality that either substantially enhances existing water quality or precludes the use of a surface water body as it is intended or designated.	Substantive change in water quality that either substantially enhances existing water quality or precludes the use of an aquifer's designated use.	Substantive changes in or loss of wetland habitat or functionality.	Substantive changes in floodplain characteristics that either substantially enhance existing floodplain functions and quality or preclude the use of a fully functional floodplain.
Medium Mitigations may be required in certain instances based on the context and duration of the impact.	Moderate changes in water quality that either enhance existing water quality or that result in recoverable interruption of a surface water body's designated use.	Moderate changes in water quality that either enhance existing water quality or that result in recoverable interruption of an aquifer's designated use.	Moderate changes in wetland habitat or functionality that either enhance existing water quality or that result in recoverable interruption of a wetland's baseline functions and quality.	Moderate changes in floodplain characteristics that either enhance existing floodplain functions or that result in a fully functional floodplain.
Low Adverse impacts recoverable through natural processes with no mitigations required.	Minor changes in water quality that neither enhance nor disrupt a water body's intended/designated use.	Minor changes in water quality that neither enhance nor disrupt an aquifer's intended/designated use.	Minor changes in wetland quality and functions that neither enhance nor disrupt a wetland's baseline functions and quality.	Minor changes in floodplain characteristics that neither enhance nor disrupt a floodplain's baseline functions.
Neutral	No perceptible water quality changes.	No perceptible water quality changes.	No perceptible changes in wetland quality or function.	No perceptible changes in floodplain characteristics.
Duration				
Long term	Effect would likely endure for the life of the action.			
Medium term	Effect would likely last for a few months to a year.			
Short term	Effect would likely last for a few days to weeks.			

### 3.7.1.3 Impact Levels

The level of impact associated with water resources and the impact's potential significance is determined by considering how Proposed Action effectors could interact with water resources in terms of context, intensity, and duration as described in [Table](#)

3-35. [Table 3-36](#) explains the impact level categories for water resources analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-36. Impact Level Categories for Water Resources**

Level of Impact	Surface Water	Ground Water	Wetlands	Floodplains
Adverse	Adverse impacts may result in degradation to surface water, the level of impact directly related to the impact attributes described in <a href="#">Table 3-35</a> . Adverse impacts may be perceived as significant under high-intensity scenarios over a long-term duration where there is substantive contamination through sedimentation and/or chemical interactions. Insignificant impacts may occur under medium- to low-intensity scenarios of a short-term or temporary duration and lesser amounts of sedimentation and/or chemical contamination.	Adverse impacts may result in degradation to ground water availability and/or quality, the level of impact directly related to the impact attributes in <a href="#">Table 3-35</a> . Impacts may be perceived as significant under high-intensity scenarios with long-term use/drawdown of supplies or contamination. Insignificant impacts may occur under medium- to low-intensity scenarios with a short-term duration of increased ground water use/drawdown or smaller amounts of contamination.	Adverse impacts may result in direct or indirect degradation to jurisdictional wetland habitat and/or functions, the level of impact directly related to the impact attributes in <a href="#">Table 3-35</a> . Impacts may be perceived as significant under high-intensity scenarios of any duration with contamination of entire wetland areas or loss of entire wetlands. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration that result in small amounts of contamination of wetland area segments or partial loss of wetland area/vegetation.	Adverse impacts may result in loss of floodplain area and/or function, the level of impact directly related to the impact attributes in <a href="#">Table 3-35</a> . Impacts may be perceived as significant under high-intensity scenarios of any duration resulting in loss of large areas of floodplain area and/or function. Insignificant impacts may occur with only localized, segmental disturbance of floodplain area that does not necessarily result in overall loss of floodplain functionality.
	High-intensity impacts are typically only recoverable through long-term natural processes and/or substantive mitigations, while lesser impacts are recoverable over the short to medium term through natural processes or with minor mitigation.			
Neutral / no effect	Actions that improve or protect water resources or result in no noticeable change.			

### 3.7.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to water resources. Use of fuels for generators would require implementation of Air Force spill control and response procedures to minimize surface/ground water interactions from any spills. The proposed use of emitter sites would not involve any land disturbance activities within or near water resources. As a result, given the negligible potential for interactions/impacts to water resources and the negligible potential to impact public health or the human and natural environment, and the fact that this activity would not result in potential violations of federal, State, or local regulations, this Proposed Action component is not carried forward for detailed analysis in Chapter [4](#).

### 3.7.3 General Training Activity Impact Assessment

#### Land Disturbance

Land disturbance due to land improvement activities is a potential impact for all water resources in each tactical area. There would be no land improvement activities resulting in any direct or indirect effect on surface water resources since these activities would not occur. The Air Force would utilize areas for LZs/DZs that were previously cleared by the FFS as part of normal silvicultural activities. No filling or disturbance of wetlands or floodplains is proposed, and no USACE Section 404 permitting requirements have been identified.

Land disturbance due to NRC is a potential impact for surface waters and wetlands in all tactical areas. Potential effects from removal of water, animals, and plants from surface water and wetlands would be direct, but on a minor scale. Disturbance would be limited to localized disturbance of surface water, sediments, and shorelines of surface waters and wetlands, which can temporarily suspend sediments and diminish water clarity. Disturbance from consumption would be temporary and limited to localized areas; these effects would quickly diminish once foraging troops moved out of the area and would be negligible. Under Subalternative 1 this activity would not occur.

#### Ground Movement

Ground movement activities that could affect water resources include wheeled vehicle use and CCDM. Ground movement would not be expected to impact floodplains because wheeled vehicles would remain on established roadways, and foot traffic would not impact the functionality of a floodplain.

Wheeled vehicle use for ground movement is a potential impact for water resources in all tactical areas. Wheeled vehicle use would not have any direct effect on surface water resources since vehicles would not be allowed direct access to any surface waters or wetlands under the LU-1 protection level. Vehicle use would be restricted to existing roads and trails and approved, existing crossing locations in streams and wetlands. If off-road vehicle use is required for any reason the respective FFS Management Office would need to be consulted prior to occurrence, and no vehicles would be allowed within 100 feet of a surface water body or wetland as specified by EABFI 13-212.

Wheeled vehicle activities could potentially have indirect effects on water resources. Routine use of the existing dirt road network that extends throughout the tactical areas is a regular contributor to roadway erosion, and a recognized problem affecting some streams and wetlands (Florida Division of Forestry [FDOF], 2000). Leaks of fuel and other vehicle fluids would also be a potential indirect source of contamination to water resources as described under land improvement effects. Some indirect effects to water resources from roadway erosion are likely and assumed to occur. While the potential for these occurrences are inherent to vehicle use (whether for the military, the FFS, or civilians) and unavoidable, implementation of standard vehicle maintenance and spill prevention SOPs would minimize the potential for occurrence to a negligible level.

Dismounted troop movement is a potential impact for surface water and wetland resources in all tactical areas. Potential effects would be direct, but on a minor scale.

Large groups or heavy repeated use of a particular area can cause stream banks or shorelines to erode, indirectly affecting water clarity, stream course, and rate of flow. Rotation of any stream or water body ingress/egress areas would serve to minimize the potential for any medium to long-term impacts associated with shoreline erosion, and units would be advised to avoid any noticeably eroded shorelines. Over the short term sediments in fast-flowing streams typical of those found on the forests would settle rapidly and water clarity would return, causing the streams to return to their former state once units had moved on.

### Expendables

Under the Proposed Action, pyrotechnics (including smoke grenades) and other expendables are prohibited within LU-1 protection areas associated with surface waters and wetlands. Use of blanks and paintballs would not be expected to result in adverse impacts to water resources because any brass casings or other debris would be picked up as part of general operating constraints identified in Section [2.5](#). Section [3.12](#) further discusses the components of expendables and the potential for water and soil contamination, which is minimal. Under Subalternative 1 expendable use would be limited to the hardened camp sites at BRSF, which would further limit impact potentials from expendable use.

### Amphibious Operations

AO may potentially impact surface waters and associated shorelines throughout the forest areas, as personnel may use any of the surface waters. Potential effects of AO would include disturbance of streambeds and shorelines from the loading and unloading of watercraft and movement of watercraft on the surface waters, as well as ingress/egress of troops over the land/water interface as discussed in detail in the *Riverine/Estuarine Programmatic Environmental Assessment (U.S. Air Force, 2004)*. AO would adhere to the General Operational Constraints and mitigations identified in Section [2.5](#) associated with EAFBI 13-212 Section 7.2.9. Impacts to water resources would be minimized to less than adverse by limiting activity to designated landing zones and by rotating landing zones when these areas show signs of erosion. There is potential for release of fuel from watercraft to surface waters, however this potential is inherent in watercraft use (whether military or civilian). Such potential for adverse impacts are minimized to a negligible level by implementation of SOPs for watercraft maintenance and spill prevention procedures as identified in Section [3.12](#), *Solid and Hazardous Materials/Waste*. Under Subalternative 1 this activity would not occur, which would eliminate potential impacts associated with this activity.

#### 3.7.3.1 General Training Activity Impact Assessment Summary

Based on the scope of action described in Chapter [2](#), many training activities would have at least some interaction with one or more water resource categories. [Table 3-37](#) identifies potential interactions between Proposed Action effectors and water resource receptors. Items shaded yellow have been carried forward for site-specific analyses in Chapters [5](#) (BRSF) and [6](#) (THSF). Activities shaded in green have little potential to impact the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

**Table 3-37. Receptor and Effector Interactions for Water Resources**

Effector	Water Resource Area Potentially Affected (Receptor)			
	Surface Water	Ground Water	Wetlands	Floodplains
Land Disturbance				
Land development	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No construction or land development activities would be conducted to modify or otherwise reinforce proposed LZs/DZs or existing unpaved roads. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.			
Point impact	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with water resources. There would be no digging within water resources. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.			
Incidental surface disturbance				
Consumption	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with water resources. <b>Subalternative 1:</b> This activity would not occur.			
Ground Movement				
Wheeled vehicles	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> The potential for adverse impacts is associated with water crossings (at approved locations) interacting with streams and stream banks, potentially resulting in erosion/sedimentation. This issue area has not been carried forward for site-specific analysis.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with ground water resources. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> The potential for adverse impacts is associated with stream/wetland crossings (at approved locations) potentially resulting in erosion/sedimentation and destruction of wetland vegetation. This issue area has not been carried forward for site-specific analysis.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts to floodplains would be expected. Wheeled vehicles would be used on approved roadways only; stream and wetland crossings would occur at approved locations. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.
Dismounted maneuvers	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> The potential for adverse impacts is associated with localized disturbance to streams and stream banks (e.g., erosion/sedimentation) from personnel. This issue area has been carried forward for site-specific analysis.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with ground water resources. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.	<b>The potential for adverse impacts has been identified for both the Proposed Action and Subalternative 1.</b> The potential for adverse impacts is associated with localized disturbance to wetland vegetation (e.g., trampling) from personnel. This issue area has been carried forward for site-specific analysis.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with floodplain resources. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.



**Table 3-37. Receptor and Effector Interactions for Water Resources, Cont'd**

Effector	Water Resource Area Potentially Affected (Receptor)			
	Surface Water	Ground Water	Wetlands	Floodplains
Use of Expendables				
Blanks/GBS	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts identified. Expendables may affect water resources due to release of associated chemical constituents (lead, perchlorate, and dyes). However, as identified in the Interstitial Range Environmental Assessment, use of munitions and pyrotechnics would not result in adverse impacts, given the wide area of dispersal, mechanisms for degradation, and the low amount of constituents released (U.S. Air Force, 2009). Additionally, "green" munitions would be used to the extent practicable, thus resulting in lower constituent releases. Finally, the management requirement to be at least 100 feet away from surface water for munitions and pyrotechnics use minimizes the potential for impacts. <b>Subalternative 1:</b> Potential for impacts would be much less than the Proposed Action because expendable use would be limited to BRSF hardened camp sites only.			
Smoke grenades				
Other/equipment	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts identified. There are potential impacts from spills while handling fuels. However, implementation of required spill control and response procedures would minimize this potential (see Section 3.12, <i>Solid and Hazardous Materials/Waste</i> ). <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.			
Aircraft Operations	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with water resources. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.			
Amphibious Operations	<b>Proposed Action:</b> The potential for adverse impacts has been identified associated with boat landings and nearshore activities potentially affecting shoreline erosion in streams and rivers. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with ground water resources. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.	<b>Proposed Action:</b> The potential for adverse impacts has been identified associated with activities in estuarine areas and water-land transition actions affecting wetlands. This issue area has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified since there would be little interaction with floodplain resources. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.
Utilities	This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts identified. Utilities usage at hardened camp sites would only interact with ground water, in the sense that personnel would utilize local water supplies for drinking/wastewater. However, use of this resource would be intermittent and would not result in any significant or noticeable draw on local/regional ground water supply. <b>Subalternative 1:</b> Types of impacts are the same as the Proposed Action with potential for impact less than the Proposed Action given the reduced level of proposed activity.			

BRSF = Blackwater River State Forest; BMP = best management practice; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone

### 3.7.4 Proposed Resource-Specific Mitigations

General Operational Constraints to minimize impacts to water resources are identified in Section 2.5, and have been described in the analyses. These would be inherent to the Proposed Action. Additional action-specific operational constraints or mitigations have been identified that would further minimize impact potential or the severity of identified impacts:

- To minimize localized damage potential from foraging and dismounted troop movements, the size of troop units will be kept to small manageable numbers. Over time, activities would be rotated within and among TAs to prevent

concentration of activities in particular locations. Implementation of this mitigation would allow water resources to recover from extended use after intensive training activities.

- Roads, trails, and stream/wetland crossings would be inspected before and after each training mission to identify maintenance issues that could cause problems if not repaired. Training activities would be shifted or redirected if conditions of roads and stream and wetland crossings require repair or other measures to prevent erosion from impacting surface waters and wetlands. The FFS will be notified of any identified issues. Wheeled vehicle training would only occur on crossings rated as good or fair condition; no wheeled vehicle training would occur at crossings rated Poor until these crossing are approved by the FFS.
- The potential for spills during vehicle use can be mitigated through training and use of spill prevention protocols.
- Amphibious landings would utilize designated ingress/egress points identified through coordination between the GLI Liaison and the FFS. To the extent possible AO should use established, hardened boat ramps for ingress/egress of amphibious craft. If ingress/egress must utilize natural habitat in wetlands, care should be taken to avoid destruction of wetland vegetation or other activities that might cause shoreline erosion. Ingress/egress points for both personnel and watercraft should be rotated to the extent possible to allow sites time to recover from AO.

The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measure: avoidance of “Good” and “Poor” rated vehicle water crossings for training use in order to protect the better crossing sites and minimize further degradation of the sites in poor condition.

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## 3.8 BIOLOGICAL RESOURCES

Within the context of this EIS, the term “biological resources” refers to the vegetation, wildlife, protected species, sensitive habitats, and invasive plant and animal species associated with the land areas proposed for use. Each biological resource component is referred to as a “receptor.”

### 3.8.1 Impact Assessment Methodology

The impact assessment for biological resources evaluates the potential impacts of the Proposed Action and Subalternative 1 to biological resources. Impacts to biological resources are evaluated according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

#### 3.8.1.1 Regulatory Drivers

Laws and regulations applicable to both the Proposed Action and Subalternative 1 for biological resources are summarized below.

- ESA of 1973 (16 USC 1531 to 1544; 1997–Supp): Provides for the conservation of endangered and threatened species and the ecosystems on which they depend and, per Section 7 of the act, requires federal agencies to consult with

the USFWS and/or National Marine Fisheries Service if impacts to federally listed species are possible.

- AFD 32-70: Directs the implementation of the ESA.
- AFI 32-7064: Details how to manage natural resources in such a way as to comply with federal, state, and local laws and regulations and calls for the protection and conservation of state-listed species when not in direct conflict with the military mission.
- EAFBI 13-212, Chapter 7: Identifies requirements for protection of natural and cultural resources and waste management.
- BEPA (16 USC 668–668d): Prohibits the taking or possession of and commerce in bald eagles.
- Migratory Bird Treaty Act (16 USC 703-712; 1997-Supp) and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds: Protects migratory birds and their habitats and establishes a permitting process for legal taking. The Armed Forces are exempted from the incidental taking of migratory birds during military readiness activities (such as those described in this EIS), except in cases where an activity would likely cause a significant adverse effect to the population of a migratory bird species.
- Marine Mammal Protection Act (MMPA) of 1972: Establishes a comprehensive federal plan to conserve marine mammals.
- EO 13112, *Invasive Species*: States that no federal agency shall authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive nonnative species in the U.S. or elsewhere.

### 3.8.1.2 Assessment Method

As stated in Chapter 2, the Air Force currently abides by conservation measures detailed in the *Final Formal ESA Section 7 Consultation for Interstitial Area Activities at Eglin Air Force Base, Florida* (USFWS, 2012), which addresses all protected interstitial species on Eglin. Additionally, the USFWS has issued a separate biological opinion for the red-cockaded woodpecker, which was received August 14, 2013. The conservation measures are designed to avoid or minimize impacts to protected species from training activities. Eglin AFB range users also observe procedures in EAFBI 13-212, which incorporates consultation conservation measures but also ensures environmental stewardship in general. Finally, Eglin AFB has completed a formal ESA Section 7 consultation for the GLI (included in Appendix C). Measures specified in EAFBI 13-212 and Eglin Interstitial and GLI ESA consultations, where applicable, are included in GLI training components as part of the action alternatives. For purposes of this EIS, analysis of impacts to biological resources assumed that avoidance measures in EAFBI 13-212 and conservation measures identified in the previously mentioned consultations would be implemented as part of the action alternatives. If necessary, additional potential mitigations or impact minimization measures were identified as part of the analysis.

The impacts analysis assessed the potential for both the Proposed Action and Subalternative 1 to interact with known natural resource communities or species. The impact from these interactions may be direct, indirect, or if combined with other actions, cumulative. To provide a general inventory of the natural resources at BRSF and

THSF, the Air Force accessed information from the state and federal agencies with regulatory oversight for these resources and, where available, obtained data and publications on species and community types and locations. Biological resources were categorized as vegetation, wildlife, protected species, sensitive habitats, and invasive species. Each of these categories may be impacted differently by one or more of the proposed training activities. For example, protected species and habitats have a greater sensitivity to impacts than nonprotected vegetation and wildlife. Likewise, there are specific regulations that must be considered for analyzing impacts to protected species and habitats.

[Table 3-38](#) defines how the impact attributes of context, intensity, and duration are applied to biological resource analyses.

**Table 3-38. Definitions of Impact Attributes for Biological Resource Categories**

Attribute	Vegetation	Wildlife	Protected Species	Sensitive Habitats	Invasive Species
Contexts Analyzed					
Regional/population	County level, state park level, or management unit level effects; impacts to populations.				
Localized	Less than management area effects; impacts to individuals.				
Intensity (can be either adverse or beneficial)					
High Mitigations required to minimize or avoid adverse impacts, with scope of the mitigations based on context and duration of the exposure or impact. Unavoidable adverse effects may not be recoverable.	Substantive impact that alters the landscape and results in respective change in health of ecosystem. Examples include large-scale improvement or destruction of entire vegetative communities within the associated context only recoverable over the long term.	Substantive impact that results in respective change in health of receptor. May involve substantial improvement or decline in health of species or associated habitat, such as species recovery management activities or species mortality.	Substantive impact that alters the sensitive habitat's operational health. May include large-scale increase or decrease in size of habitat.	Substantive change in invasive species environment (e.g., removal of species entirely or introduction of new species).	
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the exposure/impact. Unavoidable adverse impacts likely recoverable with BMPs and mitigations.	Moderate alteration of the landscape with no change in overall ecosystem functionality. May involve improvement or disturbance of pockets of vegetative communities within associated context, with adverse impacts recoverable over medium term.	Moderate impact to species that result in relative change in health of receptor. May involve moderate improvement to species health/habitat, distribution and/or changes, or injury.	Moderate impact that alters the sensitive habitat's operational health. May include moderate improvement in habitat quality or removal of portions of habitat.	Moderate change in invasive species environment. May include species control or introduction and expansion of existing species into new areas.	
Low No mitigations required. Unavoidable adverse impacts recoverable through natural processes.	Slight alterations to landscape (e.g., trampling or planting of individual plants) that do not affect ecosystem health/functionality. Adverse impacts are recoverable over the short term.	Minor change to overall health of receptor. May involve minor improvement to habitat, harassment or startle responses.	Negligible change to overall operational health of habitat. May involve slight improvement to habitat quality, or slight degradation with no removal.	Slight change in invasive species environment. May include expansion of existing species into existing areas of invasive species.	
Neutral	No perceptible change ecosystem health/functionality.	No observable change in wildlife distribution or behavior.	No discernible alteration to sensitive habitat.	No apparent change in invasive species environment.	
Duration					
Long term	Effect would likely endure for the life of the action.				
Medium term	Effect would likely last for a few months to a year.				
Short term	Effect would likely last for a few days to weeks.				

BMP = best management practice

### 3.8.1.3 Impact Levels

The level of impact associated with biological resources and the impact's potential significance is determined by considering how Proposed Action effectors could interact with biological resources in terms of context, intensity, and duration as described in [Table 3-38](#). [Table 3-39](#) explains the impact level categories for biological resources analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-39. Impact Level Categories for Biological Resources**

Level of Impact	Vegetation	Wildlife	Protected Species	Sensitive Habitats	Invasive Species
Adverse	Adverse impacts may result in alteration to the vegetative landscape or affect ecosystem health/functionality, the level of impact directly related to the impact attributes described in <a href="#">Table 3-38</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration and may not be recoverable. Insignificant impacts may occur under medium- to high-intensity scenarios of any duration where impacts are likely recoverable with best management practices and mitigations.	Adverse impacts may result in the mortality, injury, or decline in health of species, the level of impact directly related to the impact attributes described in <a href="#">Table 3-38</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration that result in species mortality or injury. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration with incidental harassment, injury, or potential for mortality that can be mitigated and for which permits can be obtained.		Adverse impacts may result in habitat alteration, reduced habitat size, and decline in habitat quality, the level of impact directly related to the impact attributes described in <a href="#">Table 3-38</a> . Adverse impacts may be perceived as significant under medium- or high-intensity scenarios of any duration resulting in substantive habitat degradation and removal. Insignificant impacts may occur under low- to medium-intensity scenarios of any duration where habitat alteration is recoverable.	Adverse impacts may result in the spread of invasive species, the level of impact directly related to the impact attributes described in <a href="#">Table 3-38</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration resulting in large areas of new invasive species that cannot be controlled without long-term intervention. Insignificant impacts may occur under low- to medium-intensity scenarios of any duration that create conditions that encourage spread of invasive species but manageable with conditions or mitigations.
Neutral/no effect	Activities do not affect the health of a population or habitat on a long-term basis (regardless of intensity).	Activities have no effect on the health or stability of a population or group of individuals on a long-term basis (regardless of intensity).		Activities do not have any effect on the health of a habitat or plant community on a short- to long-term basis (regardless of intensity).	Activities result in eradication of an invasive species or do not result in the spread of invasive species.



### 3.8.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to biological resources, because sensitive habitats and protected species would be avoided. The small footprint of the emitter equipment and the use of improved and semi-improved areas would not damage native vegetation or displace wildlife. Exposure to potentially harmful levels of EMR is highly unlikely, given that wildlife are not likely to approach areas where humans are active and wildlife are not likely to continuously remain within the hazard distance. JTE emitters would have a fenced 400-foot hazard area. As encroaching within the 400 foot hazard area of the JTE emitter would result in adverse effects to humans, it can be assumed that small animals able to fit within the fence surrounding the 400-foot hazard area would likewise be affected. However, radar systems are frequently equipped with a mitigating measure (elevation interlock) that shuts the system down if the radiating beam drops below horizontal, reducing the chance of exposure to terrestrial organisms on the ground (U.S. Air Force, 2003). Birds may temporarily fly in and out of the 400 foot hazard area but exposure to EMR would be brief unless birds perch on the system itself while it is in operation. Emitter site activities have little potential to impact the natural environment or do not result in potential violations of federal, state, or local regulations. Potential intermittent and random exposure of small mammals, reptiles, and amphibians to EMR would not result in a significant adverse impact. The Air Force will include FWC area biologists in emitter site establishment and use to ensure compatibility. Therefore, these activities are not carried forward for detailed analysis in Chapter 4.

### 3.8.3 General Training Activity Impact Assessment

Based on the scope of action described in Chapter 2, all training activities would have at least some interaction with one or more biological resource categories.

Per general operation constraints identified in Section 2.5, sensitive species and habitat would be protected, and aspects of EAFBI 13-212 and Eglin AFB sensitive species consultations would be implemented as part of the action alternatives. Hence, the following activities would not be expected to result in adverse impacts and are not discussed further in this chapter:

- **Land disturbance (point impact, ISD):** These activities are not likely to result in potential impacts associated with displacement or mortality of nonsensitive biological resources. These activities may result in short-term impacts that are recoverable without mitigation (e.g., placing a stake in the ground). As a result, the Air Force anticipates no adverse effect to biological resources from these activities.
- **UoEX (other/equipment):** Intermittent use of generators may result in minor, localized temporary noise disturbance to wildlife but would not otherwise interact with flora or fauna. The Air Force expects no effect to wildlife from the temporary noise associated with generator use.
- **Utilities:** Utilities usage would not interact with flora or fauna and, therefore, would not impact biological resources.

## **Vegetation**

Aircraft operations would not be expected to have any impact on vegetation.

### ***Land Disturbance***

Land disturbance associated with aircraft operations, would result in minor surface disturbance, causing either trampling or vegetation removal. Such impacts would be short term and recoverable, as use of LZ/DZs rotates. Mitigations associated with land development practices (e.g., soil erosion prevention) may be required. Under the Proposed Action, consumption of vegetation would result in direct physical impacts to vegetation, but these impacts would be very localized and intermittent and would not be expected to adversely impact the overall vegetative environment of the forest. These potential impacts apply to all tactical areas where land development may occur.

#### Subalternative 1 (Preferred Alternative)

Under Subalternative 1 consumption would not occur.

### ***Ground Movement***

#### Proposed Action

All activities involving wheeled vehicles would occur on designated roads and established crossing points utilized by the FFS. While water crossings could interact with aquatic vegetation at designated crossings, the Air Force would coordinate with the FFS to ensure that degraded crossings either are not utilized or are reported. CCDM may result in trampling of vegetation as personnel walk through the forest. However, these impacts would be localized and recoverable over the short term. Personnel would rotate utilization, thus further minimizing potential adverse impacts.

#### Subalternative 1 (Preferred Alternative)

Impacts would be similar to those described under the Proposed Action, with CCDM at BRSF limited to the identified movement corridor; this would result in less potential for impacts than under the Proposed Action.

### ***Expendable Use***

#### Proposed Action

Indirect impacts from wildfires started by expendables would have both adverse and potentially beneficial impacts to vegetation. Generally, controlled fire can be beneficial to ecological communities and species by maintaining the grassy understory and preventing mid-story encroachment. However, wildfires can damage the habitats of species that rely on these communities. The FFS utilizes a fire management program that includes wildfire prevention, detection and suppression, and prescribed burning.

#### Subalternative 1 (Preferred Alternative)

Expendable use would be limited to the BRSF hardened camp sites, and none would be used at THSF. Therefore potential impacts would be much less at BRSF than under the Proposed Action, and there would be no impact at THSF.

## ***Amphibious Operations***

### Proposed Action

There would be potential adverse impacts to shoreline and aquatic vegetation due to trampling/rutting associated with landing of watercraft along shorelines. Impacts would be short term and recoverable through mitigations such as rotation of established boat landing sites.

### Subalternative 1 (Preferred Alternative)

This activity would not occur; therefore there would be no impact.

## **Wildlife**

Wildlife could be directly impacted by land disturbance, temporary disturbance and displacement from ground movement and vehicle and boat collisions, and noise and wildfire from UoEX.

## ***Land Disturbance***

### Proposed Action

Some incidental impacts may occur during LZ/DZ site use due to trampling or crushing from equipment. However, activities would occur within cleared areas, and most species would move from the area during LZ/DZ use; these areas are currently disturbed as part of regular FFS management activities. Impacts would be incidental, and given the scope of activities the potential for impact is minimal. During training under the Proposed Action, some wildlife such as birds, reptiles, and small mammals would be consumed by troops. However, the amount consumed would not be enough to decrease a population or have regional impacts and would not be considered significant given the extent of public use and hunting in the state forests. Consumption levels would be minimal, and be less than wildlife takes from recreational hunters.

### Subalternative 1 (Preferred Alternative)

Types of impacts would generally be the same as those described under the Proposed Action. However, consumption would not occur under Subalternative 1, and there would be a reduced level of activity versus the Proposed Action. Therefore, the potential for, and level of, impact associated with land disturbance to wildlife would be much less.

## ***Ground Movement***

### Proposed Action

Vehicles would operate on established roads under 35 miles per hour (mph), which should reduce the chance for collision. The number of vehicles that would be used, and the proposed frequency, results in only a small increase in the baseline traffic on local roads; as a result, the potential for a roadway collision would be considered similar to the baseline condition. Ground troop movement is unlikely to impact wildlife in any appreciable manner, as wildlife generally avoid persons walking through the forest, similar to hikers that currently use the forest. Troop sizes would be relatively small (Section [2.3.3](#)) and the chances for trampling of wildlife would be negligible.

### Subalternative 1 (Preferred Alternative)

At BRSF troop movements would be limited to identified LZs/DZs and movement corridor.

Types of impacts would generally be the same as those described under the Proposed Action. However, there would be a reduced level of activity versus the Proposed Action. Therefore, the potential for, and level of, impact associated with ground movement to wildlife would be much less.

### ***Expendable Use***

#### Proposed Action

Expendables would generate noise and smoke that would temporarily disturb or displace wildlife, and there would be a potential for these items to start wildfires.

Wildlife could also be disturbed by noise produced during small arms fire and use of ground-burst simulators. At BRSF noise-generating expendables would only be used at the hardened camp sites; at THSF these items could be used anywhere outside noise buffers identified in Section [2.5](#). Individuals could be startled by the firing of 5.56-mm and 7.62-mm inert rounds, with reactions similar to those described for overflight noise. The 7.62-mm rounds would be the more impactful of the two sizes, producing noise levels of 102 dB at 1,000 feet from the firing point. There is the potential for nesting birds to be startled enough to displace an egg or nestling from their nest or even abandon their nest. However, most animals (including birds) in the immediate vicinity of ground training operations would be aware of human presence and may move some distance away before munitions were fired, thus exposing fewer individuals to noise effects. Ground-burst simulators would produce substantially greater noise levels, potentially resulting in physiological harm (hearing effects) or behavioral effects to species in the immediate vicinity. Noise levels associated with munitions use are provided in Section [3.3](#).

Expendables would also produce a potential increase in wildfire occurrences. With the exception of some protected species on Eglin AFB that are monitored by Eglin Natural Resources, the impacts to wildlife from mission wildfires at Eglin have not been quantified. As fire is routinely employed by natural resource managers at both Eglin and by the FFS for ecological management, it is both beneficial and necessary for some habitats but can be detrimental under the wrong conditions (FDACS, 2007; U.S. Air Force, 2013a). To minimize the potential for wildfires, training groups would follow general operation constraints identified in Section [2.5](#); for example, during days with low fire danger, there are no restrictions on missions, but on days with extreme fire danger, no pyrotechnics are allowed without prior approval from the Eglin WFPM. The Air Force would work with the FFS to develop a similar approval process.

Expendables can also produce chemical residue that could potentially impact wildlife through direct contact, ingestion, inhalation, or bioconcentration. The most likely opportunity for such exposure would be immediately after the smoke has been dispelled. However, wildlife would most likely leave the area during training exercises, thereby reducing the likelihood of direct exposure. The potential for ingestion or inhalation of particles in sufficient amounts to cause harm is also low, due to wind-driven distribution of smoke particles.

### Subalternative 1 (Preferred Alternative)

Expendables would not be used at THSF, and no expendables would be used outside the hardened camp sites at BRSF. Impacts at the BRSF hardened camp sites would generally be the same as those described for the Proposed Action.

### ***Aircraft Operations***

#### Proposed Action

Aircraft would generate noise that would temporarily disturb or displace wildlife. The potential effects of aircraft overflight on animals have been investigated to varying degrees, depending on the species. A substantial literature synthesis report was compiled and published in 1998 as a cooperative effort between the USFWS and the Air Force Engineering and Services Center at Tyndall AFB, Florida (Manci et al., 1988). A review of available literature of the effects of aircraft noise on domestic animals (among other types of animals) is also provided by NoiseQuest (2013). The following information is derived from these sources, except where otherwise noted.

Animal response to aircraft noise is influenced by many variables such as aircraft size, speed, proximity, and engine noise level, among others. In addition, response may differ according to aircraft type (fixed wing versus rotary wing). Noise effects may be categorized as primary, secondary, and tertiary. Primary effects include direct physical auditory impacts such as eardrum rupture and hearing threshold shifts. Secondary effects include stress, behavioral changes, and decreased ability to perform functions such as obtaining food. Tertiary effects include population decline and habitat destruction. Stress and associated behavioral changes may be among the more commonly observed effects of noise. A sudden or unfamiliar sound may act as an alarm, activating the sympathetic nervous system and triggering short-term physiological reactions (fight-or-flight response). These reactions cause energy reserves to be used, may interrupt important behaviors, and may result in injury (trampling, etc.). Conversely, wildlife may become habituated to repeated noise and show no observable response over time. While birds, small mammals, and reptiles may experience noise and associated effects to varying degrees, such species occurrences are expected to be insignificant based on the condition of the LZs (i.e., disturbed agricultural fields) and the extent of use under the Proposed Action. Of most concern are domestic livestock near LZ locations. See Appendix H, Section H.2.8 for noise effects on wildlife, including migratory birds.

Noise produced by aircraft overflights and helicopter hovering would likely disturb wildlife on the LZs/DZs and nearby vicinity. The potential for impacts due to overflights would be greater than that associated with hovering. Birds may react by exhibiting a startle response. Based on previous studies, and depending on the species and type of activity at the time of exposure, response could range from simply looking toward the aircraft to flushing (and associated energy expenditure) or other effects such as interruptions of nesting or breeding and abandonment of young. Raptors would probably have the least potential for behavioral reactions, while waterfowl and some passerines would be more likely to be affected.

Low-level flights would likely disturb or cause a startle reaction in mammal species. Although the effects on some comparatively large mammals specifically found in the



area (e.g., deer, black bears) are uncertain, it may be assumed that noise levels greater than 90 dB would cause at least some behavioral reaction such as freezing or fleeing. Various effects, including startle effects and potential changes in habitat use, could occur in smaller mammal predators such as coyotes and foxes. Although effects to small mammals such as squirrels, mice, and rats have been suggested at noise levels from 69 to 115 dBA, based on discussion provided in U.S. Air Force (2001), the effects are likely to be small.

In general, although wildlife species may exhibit startle or escape responses to aircraft overflight, these responses are not necessarily detrimental long-term to a species, nor is reaction to aircraft noise alone enough to imply adverse effect. Animals react to a variety of external stimuli. Most affected individuals would likely resume normal activities soon after training events are completed. Low-level aircraft flight noise is not expected to significantly affect the overall health or viability of wildlife populations.

Short-term startle effects due to visual sightings of aircraft could cause temporary displacement of individuals inhabiting areas surrounding the LZs/DZs. However, animal species would likely habituate to aircraft presence over time, given the ongoing tempo of day-to-day training. Some degree of habituation may already exist for some individuals because a variety of aircraft overflights by civilians, the FFS, and the military currently occurs in the forest regions. Long-term reactions or significant behavior modifications are not expected from visual aircraft sightings.

#### Subalternative 1 (Preferred Alternative)

Aircraft operations would be similar to those described under the Proposed Action, although the potential for impacts would be less given the reduced level of proposed activity.

### ***Amphibious Operations***

#### Proposed Action

Aquatic wildlife may be directly impacted by a boat or indirectly impacted by disturbance or harassment during amphibious operations, but usage of the water areas would be similar to current recreational and commercial use and, therefore, would not be significant.

#### Subalternative 1 (Preferred Alternative)

This activity would not occur; as a result there would be no impact.

### **Protected Species**

#### ***Proposed Action***

Impacts to protected species are similar in nature to those described previously for vegetation and wildlife. Protected species could be directly impacted by vehicle collisions, land disturbance, and expendables (from wildfire), but the impacts are not anticipated to be significant because known species would be protected. Further, the effector mechanisms of noise and human activity related to military training are not unlike that of recreational hunting, logging, and other human activities that have been

conducted at the forests for many years. Thus, some species may have acclimated to noise and other disturbances.

Noise and human presence could disrupt feeding, breeding, and nesting activities, but the Air Force would observe management practices as specified in EAFBI 13-212 that protect wildlife and minimize disturbance from noise and human contact. Such measures include establishing buffer areas around known RCW habitats. In addition, the Air Force would familiarize troops with protected species, such as the Florida black bear and indigo snake, so these animals would not be inadvertently injured or consumed during training. Areas potentially slated for ground disturbance, such as road widening, would be cleared of gopher tortoise burrows, and the animals would be relocated.

Wildfires can harm protected species, or their habitats. Fire response can involve heavy equipment, such as fire plows, which can cut tree roots or, in wetland areas, change the hydrology (water occurrence and flow) upon which protected species depend. The Air Force would observe the FFS fire hazard index, which would minimize the potential for wildfire, and would not use expendables near sensitive habitats.

#### ***Subalternative 1 (Preferred Alternative)***

Impacts to sensitive species would be similar to those described under the Proposed Action, although the potential for impacts would be less given the reduced level of proposed activity.

#### **Sensitive Habitats**

##### ***Proposed Action***

Impacts to sensitive habitats are similar in nature to those described previously for vegetation and wildlife. Known sensitive habitats would be protected, and areas potentially slated for ground disturbance would be cleared of gopher tortoise burrows, which would be relocated if necessary.

#### ***Subalternative 1 (Preferred Alternative)***

Impacts to sensitive habitats would be similar to those described under the Proposed Action, although the potential for impacts would be less given the reduced level of proposed activity.

#### **Invasive Species**

##### ***Proposed Action***

Invasive species can be spread or introduced directly as units, vehicles, vessels, and equipment move from one area of the forest to another and from other parts of the country. Because humans can act as vectors for the spread of invasive species, vehicle traffic and ground movements by troops could introduce and spread invasive species.

To reduce the potential of spreading invasive species, vehicles and equipment would be cleaned before and after use in accordance with Armed Forces Pest Management Board Technical Guide No. 31 *Retrograde Washdowns: Cleaning and Inspection Procedures* (U.S. Army, 2012). Vehicles and boats would not be used in areas with

known invasive species problems. Impacts to native vegetation from invasive species would not be significant.

Wildfire can create conditions that enable fast-growing invasive species to colonize burned areas and become established before native vegetation. Wildfires caused by expendables may also impact invasive species. Wildfires may provide an opening for invasive species to spread. Conversely, invasive species may be killed in wildfires, thereby benefitting the health of the forest.

#### **Subalternative 1 (Preferred Alternative)**

Impacts to invasive species would be similar to those described under the Proposed Action, although the potential for impacts would be less given the reduced level of proposed activity.

### **3.8.3.1 General Training Activity Impact Assessment Summary**

[Table 3-40](#) identifies potential interactions between Proposed Action effectors and biological resource receptors. Activities shaded in green have little potential to impact the natural environment or result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#). Activities shaded yellow have the potential for adverse impacts and are carried forward for site-specific analysis in Chapters [5](#) and [6](#).

**Table 3-40. Receptor and Effector Interactions for Biological Resources**

Biological Resource Area Potentially Affected (Receptor)					
Effector	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for activities to disperse invasive plants/seeds. However, implementation of General Operational Constraints would minimize any potential adverse impacts. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.
Land development	This issue has not been carried forward for detailed analysis. <b>Proposed Action:</b> Potential for localized, nonprotected species annoyance (noise), displacement, or mortality. However, these impacts are expected to be low-intensity in nature and recoverable over the short-term given that land development activities would only occur on established roadbeds. No population effects have been identified. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.				
Point impact					
Incidental surface disturbance					
Consumption	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Direct mortality to nonprotected species of wildlife. Potential to directly affect protected species (if misidentified). However, implmentation of General Operational Constraints would minimize this impact potential to a neutral level. No population effects have been identified. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.				
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Wheeled vehicles would be used on approved roadways only. Minimal potential for incidental direct physical impact (e.g., being struck by vehicle). <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.
Wheeled vehicles	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Wheeled vehicles would be used on approved roadways only. Minimal potential for incidental direct physical impact (e.g., being struck by vehicle). <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level		This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Wheeled vehicles would be used on approved roadways only. Water crossings (at approved locations) may interact with aquatic vegetation; however, these impacts are not considered significant given context,		

**Table 3-40. Receptor and Effector Interactions for Biological Resources, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
	of impact associated with reduced level of activity.		intensity, and implementation of General Operational Constraints. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.		
Dismounted maneuver	<b>Proposed Action:</b> Potential for adverse impacts has been identified associated with incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.				
Use of Expendables	At BRSF, under the Proposed Action, noise-generating expendables would only be used at hardened camp sites. Under Subalternative 1, noise-generating expendables would only be used at hardened camp sites at BRSF.				
Blanks/GBS	<b>Proposed Action:</b> Chemical components from smoke grenades and munitions by-products would potentially become available via ingestion or inhalation but this potential is considered minimal. Potential adverse impacts associated with disturbance from noise and wildfires from GBSs and smoke grenades has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Impacts would be limited to the hardened camp sites at BRSF; there would be no impacts at THSF.		<b>Proposed Action:</b> Potential adverse impacts have been identified associated with wildfires from GBSs and smoke grenades. This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Impacts would be limited to the hardened camp sites at BRSF; there would be no impacts at THSF.		<b>Proposed Action:</b> Potential adverse impacts have been identified associated with burned areas from wildfires started by expendable allowing establishment and spread of invasive species. This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Impacts would be limited to the hardened camp sites at BRSF; there would be no impacts at THSF.
Smoke grenades					
Other/equipment	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Use of generators may result in minor noise disturbance to wildlife species. Other expendables/equipment are not anticipated to interact with flora/fauna. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.				
Aircraft Operations	Known protected species locations would be protected and not used as LZs/DZs.		This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Nonsensitive vegetation may be trampled at LZs/DZs. However, given context and intensity this impact is considered negligible. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.		This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for activities to disperse invasive plants/seeds. However, implementation of General Operational Constraints would minimize any potential adverse impacts. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.
	<b>Proposed Action:</b> Potential adverse impacts have been identified from noise and activity disturbance. This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.				
Amphibious Operations	Known protected species locations would be protected and not used as ingress/egress sites. Under Subalternative 1, amphibious operations would not occur.		<b>Proposed Action:</b> Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as		
	<b>Proposed Action:</b> Potential for incidental direct physical impact (boat strike) or incidental indirect impact				

**Table 3-40. Receptor and Effector Interactions for Biological Resources, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
	(disturbance or harassment). This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.		could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. This issue has been carried forward for site-specific analysis. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.		
Utilities	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Utilities usage at hardened camp sites would have no interaction with biological resources. <b>Subalternative 1:</b> Same as the Proposed Action, with reduced level of impact associated with reduced level of activity.				

BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground-burst simulator; LZ = landing zone; THSF = Tate's Hell State Forest

### 3.8.4 Proposed Resource-Specific Mitigations

General Operational Constraints to minimize impacts to biological resources are identified in Section 2.5, and have been described in the analyses. No resource-specific mitigations have been identified outside of those requirements associated with the ESA Section 7 consultation for this action, as provided in Appendix C, *Consultation Documentation*. The consultation requirements have been incorporated into the Operational Constraints because they are required to be implemented as part of the Proposed Action/Subalternative 1.

## 3.9 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic sites, structures, artifacts, and any other physical or traditional evidence of human activity considered relevant to a particular culture or community for scientific, traditional, religious, or other reasons. Each cultural resource component is referred to as a "receptor."

As defined under 32 CFR 800 (I)(1), "Historic Property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."

The cultural resources sections in this EIS describe known historic properties within the affected areas that are potentially eligible for the NRHP and evaluate whether elements of the Proposed Action would potentially affect these resources. They include any archaeological resources considered eligible, potentially eligible, or currently listed on the NRHP. This may include historic structures, historic districts, any known historic cemeteries, traditional cultural properties (TCPs), or sacred sites (SSs). In addition,



areas where adequate effort to identify cultural resources have not occurred are discussed as well.

### 3.9.1 Impact Assessment Methodology

The impact assessment for cultural resources evaluates the potential impacts of the Proposed Action to cultural resource receptors. Impacts to these resources are evaluated according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the regulatory drivers identified below. Together, these factors define the potential significance of the impacts.

#### 3.9.1.1 Regulatory Drivers

Attention to cultural resources is necessary for the Air Force to comply with a host of federal laws, regulations, and EOs, including:

- The NHPA of 1966, as amended. Under NHPA, the Air Force is required to consider the effects of its undertakings on historic properties listed or eligible for listing on the NRHP and to consult with interested parties regarding potential impacts per 36 CFR. The regulatory NHPA Section 106 compliance process consists of four primary stages. These include initiation of the Section 106 process (36 CFR 800.3); identification of historic properties (36 CFR 800.4), which includes identifying historic properties potentially affected by a proposed action; assessment of adverse effects (36 CFR 800.5), which determines whether the action would affect historic properties and if effects to those properties might be adverse; and resolution of adverse effects (36 CFR 800.6) between affected and consulting parties such as the SHPO, the Advisory Council on Historic Preservation, Indian tribes, and interested individuals. Additional stipulations are provided for in the NHPA should efforts fail to resolve adverse effects during this process (36 CFR 800.7).
- The DoD frames its Native American and Alaska Native Policy of 20 October 1998 in terms that emphasize the responsibility of DoD personnel to consult with tribal governments on a government-to-government basis very early in the decision-making process. This policy memorandum requires an effort to increase understanding between tribes and DoD personnel and to assess tribal positions on issues with the potential to significantly affect protected tribal resources, tribal rights, and Native American lands (DoD, 1998). Also applicable is DoDI 4710.02, *DoD Interactions with Federally Recognized Tribes*, of September 14, 2006. This DoDI strengthens and elaborates on the 1998 policy. AFI 90-202, *Air Force Interactions with Federally Recognized Tribes*, implements Department of Defense Instruction (DoDI) 4710.02. It directs Air Force installations to build relationships and conduct consultation with federally-recognized Indian/Alaska Native tribes, bands, nations, pueblos, or communities as required by federal laws and regulations,
- The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001 et seq., as amended) addresses the protection of Native American

burial sites and regulates the removal and study of human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands or by institutions receiving federal funding.

- DoD Instruction 4715.03, *Environmental Conservation Program*, DoD Instruction 4715.16, *Cultural Resources Management*, and AFI 32-7065, *Cultural Resources Management*, outlines and specifies procedures for Air Force cultural resource management programs.

Other federal laws and regulations governing cultural resources include:

- Antiquities Act of 1906
- Historic Sites Act of 1935
- Archaeological and Historic Preservation Act of 1974
- Archaeological Resources Protection Act of 1979
- American Indian Religious Freedom Act of 1978
- 36 CFR 79, Curation of Federally Owned and Administered Archaeological Collections
- 43 CFR 7, Protection of Archaeological Resources
- 36 CFR 60, NRHP
- 36 CFR 63, Determinations of Eligibility for Inclusion in the National Register

Cultural resource-related EOs that may govern the Proposed Actions include:

- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 13007, Indian Sacred Sites (SSs)
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13287, Preserve America

### 3.9.1.2 Assessment Method

As stated in Chapter 2, the Air Force currently requires activity restrictions and limitations, as well as avoidance and mitigation measures, to protect cultural resources on Eglin AFB. These measures are designed to avoid impacts to these resources. Eglin AFB Range users also observe procedures in EAFBI 13-212, where applicable, are included in GLI training components as part of the Proposed Action/Subalternative 1. For purposes of this EIS, cultural resource analysis assumed that avoidance and mitigation measures currently in place on Eglin AFB would be implemented as part of the Proposed Action/Subalternative 1. If necessary, additional avoidance or mitigation methods are recommended.

Cultural resources were analyzed by assessing each resource's state of investigation and condition, then evaluating the resource as it intersects with the Area of Potential Effects (APE) created by the Proposed Action/Subalternative 1. The ROI for this EIS is equivalent to the APE designation utilized in the NHPA. As defined under 36 CFR 800.16(d), "the Area of Potential Effects is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist."

The APE is influenced by the scale and nature of the Proposed Action and may differ according to the kinds of effects caused by the action. The APE for this project is assumed not to extend beyond the footprint of the activity boundaries as defined under each alternative training area.

NHPA obligations (as described herein) for a federal agency are independent from the NEPA process and must be complied with even when environmental documentation is not required. When both are required, the Air Force may coordinate NEPA compliance with their NHPA responsibilities to ensure that historic properties, as defined under 36 CFR 800.16(l)(1), are given adequate consideration. As per AFI 32-7065, Section 3.3.1, and 36 CFR 800.8(a), the Air Force has chosen to incorporate NHPA Section 106 review into the NEPA process, rather than substituting the NEPA process for a separate NHPA Section 106 review of alternatives (AFI 32-7065, Section 3.3.2, and 36 CFR 800[c]).

Properties identified in the APE by the Air Force are evaluated according to the NRHP criteria, in consultation with the SHPO and other parties. Typically, if the SHPO and other parties and the Air Force agree in writing that a historic property is eligible or not eligible to the NRHP, that judgment is sufficient for purposes of Section 106 (36 CFR 800.4[c][2]). Relevant procedures and criteria can be found in 36 CFR 63, Determinations of Eligibility for Inclusion in the National Register of Historic Places.

Formal initiation of the Section 106 process began with notification to the Florida SHPO and ACHP on December 18, 2013, of the Proposed Action and anticipated impacts. Also, five federally recognized tribes were notified of the Proposed Action on December 18, 2013, in accordance with the NHPA. Subsequent follow-on phone calls to the five federally recognized tribes were made in January 2014 (see Appendix C for a full record of correspondence). A government-to-government letter was mailed in February 2014. In October of 2014, a letter was mailed to the five federally recognized tribes, the Florida Forest Service and the Florida SHPO along with a copy of the draft Programmatic Agreement titled *Among Eglin Air Force Base and The Florida State Historic Preservation Officer Regarding the Proposed Gulf Regional Airspace Strategic Landscape Initiative*. In February 2015, the SHPO and Air Force signed the Final Programmatic Agreement to ensure protection of cultural resources. Information regarding these consultations and notifications are provided in Appendix C, *Consultation Documentation*.

[Table 3-41](#) defines how the impact attributes of context, intensity, and duration are applied to the cultural resource analysis.

**Table 3-41. Definitions of Impact Attributes for Cultural Resources Categories**

Attribute	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Contexts Analyzed						
Regional	Impacts to the historical context of the state forest, TCPs, or historic districts within the forest.					
Localized	Impacts to individual resources, specific sites, or locations.					
Intensity (can be either adverse or beneficial)						
High	Substantive impact that results in respective change in overall stability or character of cultural resources. Examples of adverse impacts are high- to medium-intensity ground disturbance activities resulting in alteration of a historic, archaeological, or cultural site or property that affects the overall historical context of the site.					
Medium	Moderate impact that results in respective change in stability or character of cultural resources. Examples of adverse impacts include high- to medium-intensity ground disturbance activities that result in the alteration/destruction of one or more artifacts associated with a historic, archaeological, or cultural site or property that does not affect the overall historical context of the site.					
Low	Slight impact that results in potential disturbance of cultural resources but does not result in the alteration or destruction of a historic, archaeological, or cultural site or associated artifacts. Examples of adverse impacts include incidental ground disturbance associated with walking/driving, utilization of stakes for tents, etc.					
Neutral	No impact on present cultural resources and no change to the character or nature of historic, social, or traditional context.					
Duration						
Long term	Effect would likely endure for the life of the action as cultural resources are nonrenewable and individually unique in nature. Any damage to a resource is considered permanent and nonreversible.					

TCP = traditional cultural property; SS = sacred site

If a cultural resource is impacted, mitigations or avoidance measures would be required regardless of impact context, duration, and/or intensity. However, the scope of mitigations or avoidance would be based on context and duration of the impact.

### 3.9.1.3 Impact Levels

The level of impact associated with cultural resources and the impact's potential significance is determined by considering how Proposed Action effectors could interact with cultural resources in terms of context, intensity and duration as described in [Table 3-41](#). For purposes of this EIS, there are two types of effects when considering historic properties, which are defined by 36 CFR Section 800.5:

- **Adverse Effect:** "When an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association" (36 CFR 800.5(a)(1)). Based on context and intensity factors identified in [Table 3-41](#) and the NHPA regulatory definitions of impact, the Air Force has identified the potential for adverse impacts to cultural resources. However, the Air Force has consulted with the ACHP, Florida SHPO, and applicable Native American tribes about this Proposed Action. Consultation has been completed, and documents under the NHPA Section 106 are provided in Appendix C, *Consultation Documentation*, of the Final EIS.
- **No Adverse Effect:** "When the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the

SHPO/THPO to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines, to avoid adverse effects" (36 CFR 800.5(b)).

[Table 3-42](#) explains the impact level categories for cultural resources analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-42. Impact Level Categories for Cultural Resources**

Level of Impact	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Adverse but not significant	Adverse effects occur when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, and association. The potential for regional or localized high- to medium-intensity or low-intensity long-term impacts to currently unidentified historic properties that may require mitigation or resource avoidance. Reduction or improvement in adverse effects only occurs through avoidance of the resource or mitigation of effects.					
No adverse effect	Localized or regional actions that do not affect historic properties. Either no historic properties are present or there are historic properties present but the Proposed Action would have no effect upon these properties.					

TCP = traditional cultural properties; SS = sacred sites; NRHP = National Register of Historic Places

### 3.9.2 General Emitter Activity Impact Assessment

Based on scope of action described in Chapter [2](#), emitter site use would not be expected to result in impacts to cultural resources under either the Proposed Action or Subalternative 1, because emitters would be located on property already heavily modified and disturbed with existing infrastructure in place. As a result, this resource area is not carried forward for site-specific analysis in Chapter [4](#).

### 3.9.3 General Training Activity Impact Assessment

Analysis focused on potential adverse effects to cultural resources due to physical disturbance from troop movements, bivouacking, and other ground-disturbing activities. General Operational Constraints to alleviate potential adverse effects to cultural resources from mission activities are detailed in Section [2.5](#). Under the action alternatives, these requirements would be implemented or, in some cases, certain areas would be avoided.

#### ***Proposed Action***

Cross-country ground operations, bivouacking, and other ground-disturbing activities could displace or destroy cultural resources. Dismounted movements are more likely to affect archaeological sites in areas where soil is exceptionally soft or devoid of vegetation, where activities occur on steep slopes such as along stream banks or interior gullies, or where artifacts are located on ground surface. To avoid impacts from any cross-country training operations, units must coordinate with FFS staff and the Eglin AFB 96th Civil Engineer Group/Environmental Assets (96 CEG/CEIEA) Cultural Resources Office to determine avoidance areas and only conduct ground-disturbing activities in areas known to be devoid of historic properties. If cultural resources are unexpectedly discovered during the course of proposed activities, all activity in the



immediate vicinity would cease until FFS staff or the Cultural Resources Office has been notified and a determination of significance has been rendered.

AO can affect cultural resources if such resources are either submerged and hidden or located on riverbanks or along shorelines where landings occur. If direct impacts to cultural resources occur during AO, these impacts would be more likely to damage resources, due to the exposed surface conditions and loosely consolidated sand and soils in this type of environment.

### ***Subalternative 1 (Preferred Alternative)***

In general, under Subalternative 1 impacts would be the same as those described under the Proposed Action. However, the potential for impacts would be limited to specified LZs/DZs and the movement corridor at BRSF, and the level of overall potential impacts would be less than the Proposed Action due to the decrease in the number/types of activities (e.g., no amphibious operations, no bivouacking, reduced frequency of operations, etc.). All operational constraints identified in Section 2.5 would be applicable.

#### **3.9.3.1 General Training Activity Impact Assessment Summary**

Based on the scope of action described in Chapter 2, some of the training activities under both the Proposed Action and Subalternative 1 could have some interaction with cultural resources. Table 3-43 identifies potential interactions between Proposed Action effectors and cultural resource receptors. Items shaded yellow have the potential for adverse impacts and have been carried for site-specific analysis in Chapters 5 (BRSF) and 6 (THSF). Activities shaded in green have little potential to impact cultural resources or result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters 5 and 6.

**Table 3-43. Receptor and Effector Interactions for Cultural Resources**

Effector	Cultural Resource Area Potentially Affected (Receptor)					
	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Land Disturbance	This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Land disturbance has the potential to adversely affect cultural resources. Avoidance of eligible resources or unsurveyed areas where the attempt to identify cultural resources has not occurred is required. <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with less potential for impact associated with the reduced scope of proposed activities.					
Land development						
Point impact						
Incidental surface disturbance						
Consumption	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would have no interaction with cultural resources. <b>Subalternative 1:</b> Same as the Proposed Action.					
Ground Movement						
Wheeled vehicles	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Wheeled vehicles would be used on currently used and approved roadways and crossing areas. Adverse effects to cultural resources are not anticipated. <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with less potential for impact associated with the reduced scope of proposed activities.					

**Table 3-43. Receptor and Effector Interactions for Cultural Resources, Cont'd**

Effector	Cultural Resource Area Potentially Affected (Receptor)					
	Archaeological Sites	Historic Structures	TCPs/SSs	Historic Districts	Cemeteries	Unsurveyed Areas
Dismounted maneuver	This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for direct impacts to cultural resources could occur from this activity. Avoidance of eligible resources or unsurveyed areas would be required where no attempt has been made to identify cultural resources. <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with less potential for impact associated with the reduced scope of proposed activities.					
Use of Expendables	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would have no interaction with cultural resources. <b>Subalternative 1:</b> Same as the Proposed Action.					
Aircraft Operations	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would have no interaction with cultural resources. <b>Subalternative 1:</b> Same as the Proposed Action.					
Amphibious Operations	This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would have the potential to adversely affect cultural resources. Avoidance of eligible resources or unsurveyed areas where the attempt to identify cultural resources has not occurred is required. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.					
Utilities	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would have no interaction with cultural resources. <b>Subalternative 1:</b> Same as the Proposed Action.					

TCP = traditional cultural property; SS = sacred site

### 3.9.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section 3.9, no Resource-Specific Mitigations have been identified for cultural resources in this chapter.

Resource-specific mitigations for cultural resources have been identified in the Final PA (*Programmatic Agreement Among Eglin Air Force Base and The Florida Historic Preservation Officer Regarding the Proposed Gulf Regional Airspace Strategic Landscape Initiative*). This PA identifies specific requirements associated with avoidance and/or minimization of potential impacts to cultural resources that would apply to both the Proposed Action and Subalternative 1. Such requirements (Located in stipulations, Section VI., Resolution of Adverse Effect) include; avoidance and preservation in place of resources, using flagging, signage, and temporary fencing or other such measures around the limits of property. When avoidance is not possible, Eglin AFB will notify the ACHP of an adverse effect finding and inform the ACHP that Eglin AFB will prepare a MOA with SHPO participation. Eglin will also consult the Tribes when developing this MOA if the adversely affected historic properties are TCPs or NRHP-eligible prehistoric sites, or eligible historic sites that are significant to the Tribes. More detailed information is provided in the Final signed PA located in Appendix C, *Consultation Documentation*.

All General Operational Constraints (Section 2.5) identified previously would also serve to minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

### 3.10 LAND USE

“Land use” typically refers to the management and use of land by people. Components of land use include general land use patterns, land ownership, land management plans, and special use areas. General land use patterns characterize the types of uses within a particular area. Specific uses of land typically include agriculture, barren land, rangeland, transportation/communications/utilities, forested, urban/built up, water, and wetlands. Land use also includes areas set aside for preservation or protection of natural resources, wildlife habitat, vegetation, or unique features. Management plans, policies, ordinances, and regulations determine the types of uses that protect specially designated or environmentally sensitive areas (NFWMD, 2007).

Each land use component is referred to as a “receptor.” For purposes of this EIS, the two main land use receptors considered are landowners and recreational users within and adjacent to the land areas proposed for use.

#### 3.10.1 Impact Assessment Methodology

The impact assessment for land use evaluates the potential impacts of the Proposed Action on landowners and recreational users including hunters. Impacts to these land use receptors are evaluated according to type, context, intensity, and duration (as described in Section 3.1), as well as the regulatory drivers identified below. Together, these attributes define the potential significance of the impacts.

##### 3.10.1.1 Regulatory Drivers

[Table 3-44](#) summarizes the regulations and planning documents applicable to land use under the Proposed Action. All activities would be conducted according to the guidelines presented in these documents and regulations.

**Table 3-44. Applicable Land Use Regulations and Planning Documents**

Name of Regulation/Planning Document	Description
Designated Multiple-Use of the Property, Florida Statute 589.04(3)	Permits a variety of activities on Florida state land with a focus on restoring, protecting, and managing ecosystems while at the same time integrating public use.
Air Force Instruction 32-7064; Integrated Natural Resources Management	Addresses the management of natural resources on Air Force properties to comply with federal, state, and local standards.
Blackwater River State Forest 5-Year Resource Management Plan	Provides guidelines and a framework for preserving natural resources within the state forest with a specific focus on the multiple-use concept.
Ten-Year Resource Management Plan for Tate's Hell State Forest	Outlines management goals and guidelines for maintaining a balance between the preservation of natural resources while integrating the multiple-use concept.
Eglin AFB Instruction (EAFBI) 13-212, Range Planning and Operations, Chapter 7 – Environmental Management (December 2010, Interim Change on 32 September 2011)	Identifies requirements for protection of natural and cultural resources and waste management. These guidelines would be adopted and adhered to throughout the course of the Proposed Action.

### 3.10.1.2 Assessment Method

Typically, impacts to land use involve changes in the designated land use status and the manner in which the land may be utilized by people. In certain circumstances, incompatibilities in land use may arise and require further planning or consultations between landowners until an agreeable designation is issued. Impacts can be assessed by identifying current uses and proximity to sensitive populations and determining the degree to which they would be affected by the Proposed Action and alternatives.

Impacts from noise associated with the Proposed Action are a potentially significant factor in land use compatibility. Noise generated by the setup and operation of emitter sites, as well as noise associated with the various training activities (e.g., LZs and use of expendables), could temporarily impact recreational use as well disturb adjacent landowners. Major recreational uses near the emitter sites and at BRSF and THSF that could experience potential impacts include hunting, fishing, hiking, and camping. Although noise impacts are not anticipated to permanently preclude these activities, recreational users may experience temporary disturbances that would conflict with or temporarily preclude these activities. The mitigation measures discussed in Chapter 2 would help minimize or eliminate some of the impacts felt by recreational users and adjacent landowners. See Section 3.3, *Noise*, for more details regarding the extent and duration of potential noise impacts associated with emitter sites and training activities. Sections 5.10 and 6.10 (Land Use analysis for BRSF and THSF, respectively) further detail the specific types of recreational areas and activities at BRSF and THSF.

### 3.10.1.3 Impact Levels

The level of impact associated with land use receptors and the impact's potential significance is determined by considering how Proposed Action effectors could interact with land use in terms of context, intensity, and duration as described in Table 3-45. Table 3-46 explains the impact level categories for land use analyzed in this EIS and identified in Chapters 4, 5, and 6.

**Table 3-45. Definitions of Impact Attributes for Land Use**

Attribute	Land Use Designation	Recreational Use	Landowners
Contexts Analyzed			
Regional/population/recreational areas/management areas	County level, state park level, recreational area, or management unit level effects; impacts to populations and multiple landowners.		
Localized	Less than management area effects; impacts to individuals and specific landowners.		
Intensity (can be either adverse or beneficial)			
High Mitigation measures required to minimize/avoid adverse impacts, with scope of the mitigations based on context and duration of the impact.	Substantive and noticeable changes to land use designations resulting in removal of incompatible land use designations, or introduction of new designations resulting in incompatibility and/or a violation of laws, regulations, or land use management policies.	Substantive change in recreational use resulting in relative improvement of the recreational experience or conflicts such that lack of compatibility would prohibit recreational activities from occurring. Such impacts would consist of opening of new recreational areas or creation of new restricted areas (RAs).	Substantive and noticeable changes in land use resulting in relative improvement in adjacent landowner's property values, convenience, or potential annoyance factors, or actions that result in conflict with landowners such that property values decline and activities are incompatible with current landowner uses.

**Table 3-45. Definitions of Impact Attributes for Land Use, Cont'd**

Attribute	Land Use Designation	Recreational Use	Landowners
Medium Mitigations may be required to avoid adverse impacts depending on context and duration of the impact.	Moderate changes to land use designations resulting in relative improvement of current incompatible land use designations (e.g., change from industrial to commercial), or changes in current designations resulting in a temporary or resolvable conflict of land use compatibility that does not result in a violation of laws, regulations, or land use management policies.	Moderate change in recreational use resulting in relative improvement of the recreational experience or conflicts. Such impacts may result in temporary restrictions on recreational use or occasional annoyance or removal of existing temporary restrictions.	Moderate impacts to landowners would be anticipated, such as occasional inconvenience or annoyance. These impacts would have no effect on property values or current use.
Low No mitigations required.	Negligible change in land use designation. Not anticipated to result in any relative changes in current land use compatibility.	Negligible impacts to recreational users. May result in minor, infrequent annoyance but would not prohibit recreational activities.	Negligible impacts to adjacent landowners. May result in infrequent, minor annoyance but would not result in conflicts with adjacent landowners or result in changes to property values.
Neutral	Impacts to land use that would cause no apparent change in land use designations and would not result in land use compatibility conflicts.	No impacts to recreational users.	No impacts to adjacent land owners.
<b>Duration</b>			
Long term	Effect would likely endure for the life of the action.		
Medium term	Effect would likely last for a few months to a year.		
Short term	Effect would likely last for a few days to weeks.		

**Table 3-46. Impact Level Categories for Land Use**

Level of Impact	Land Use Designation	Recreational Use	Landowners
Adverse	Adverse impacts may result in changes in regional or local land use designations, the level of impact directly related to the impact attributes described in <a href="#">Table 3-45</a> . Adverse impacts may be perceived as significant under high-intensity scenarios at any duration where permanent changes in land use designations result in conflict with existing land use management plans, statutes, or other policies. Insignificant impacts may occur under medium- to low-intensity scenarios of any duration causing a temporary or resolvable conflict of land use compatibility.	Adverse impacts may result in recreational use conflicts or preclude recreational use, the level of impact directly related to the impact attributes described in <a href="#">Table 3-45</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if permanent conflicts preclude recreational use. Insignificant impacts may occur under high- to medium-intensity scenarios of any duration that may cause temporary recreational use conflicts.	Adverse impacts may result in annoyance or conflicts with landowners, the level of impact directly related to the impact attributes described in <a href="#">Table 3-45</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration if they cause substantial long-term annoyance and/or permanent conflicts to affected landowners. Insignificant impacts may occur under any intensity of any duration resulting in



**Table 3-46. Impact Level Categories for Land Use, Cont'd**

Level of Impact	Land Use Designation	Recreational Use	Landowners
			infrequent, minor annoyance but no conflicts with adjacent landowners or result in changes to property values.
Neutral/no effect	Activities do not result in a conflict of land use compatibility regardless of intensity.	Activities would not prohibit or otherwise interfere with recreational uses, regardless of intensity.	Activities would not cause a conflict with landowners, regardless of intensity.

### 3.10.2 General Emitter Activity Impact Assessment

The main issues affecting land use would be associated with the safety hazards from emitters and the potential for emitter SHDs (as described in Section [3.4, Safety](#)) to encroach on existing land uses, thus resulting in incompatibility. While the EMR, as expressed in SHDs associated with the emitters, is unlikely to impact/change existing land use designations or recreational opportunities, or conflict with adjacent land owners, site-specific analysis of land use has been carried forward to Chapter [4](#).

### 3.10.3 General Training Activity Impact Assessment

#### *Proposed Action/Subalternative 1*

Adverse impacts to recreational users may occur as a result of temporary annoyance from noise during training activities. These impacts would mainly occur in the interstitial areas between identified recreational sites, because established recreational sites identified would be avoided for noise-generating activities such as aircraft overflights and expendable use (see Section [3.3, Noise](#)). While the quality of the recreational experience may be somewhat diminished by noise impacts, this would not preclude recreational use or cause general incompatibility, and impacts would be intermittent and short term in duration. Noise and safety impacts affecting land use for adjacent landowners would be mitigated through implementation of General Operational Constraints identified in Section [2.5](#), and Proposed Resource-Specific Mitigations identified in Section [3.3 \(Noise\)](#) and Section [3.4 \(Safety\)](#). Overall, the Air Force has not identified any changes to land use designations or significant land use conflicts.

#### *Proposed Action*

Potential interactions between recreational users, hunters, and military personnel engaged in training activities could also occur primarily as a result of ground movement activities (i.e., wheeled vehicle use and dismounted troop movements).

In order to minimize the potential for adverse impacts on hunting activities in the WMAs located within BRSF and THSF, the Air Force would coordinate with the applicable regulatory agencies (i.e., FFS, FWC, USFWS) to identify training constraints based on hunting seasons and locations. This would allow the Air Force to develop a scheduling process specific to each state forest and WMA, which could be adjusted as use and conditions mature over time and as specific hunting seasons and hunt areas change.

Individual state forest hunting season examples are provided in the respective forest chapters (BRSF: Chapter [5](#); THSF: Chapter [6](#)), along with the respective WMAs.

Amphibious activities would avoid those waterways used extensively for recreational purposes (e.g., Coldwater Creek) and would mostly utilize larger bodies of water given the size requirements for the amphibious watercraft. Should recreational users and military trainees be present on the same body of water, training activities would not impede fisherman, boaters, or tubers.

There could be some small-scale, temporary public access restrictions to specific training locations while training occurs (e.g., blackout driving). However, this would not negatively impact overall land use because the restrictions would be localized, short-term in nature, and access would resume once training activities have ceased. Regarding use of LZs/DZs and activities involving CCDM, there would be no access restrictions. If there are troop/public encounters training activities would cease and/or troops would allow persons to move on before resuming training.

#### *Subalternative 1 (Preferred Alternative)*

Under Subalternative 1 the coordination process between the Air Force and applicable regulatory agencies to avoid potential conflicts between training activities and hunting with the WMAs would be the same as described for the Proposed Action. However, the potential for interactions would be minimized because of the reduced number of training activities that would be allowed along with the reduced frequency and duration of activities (see Section [2.3.2](#)). For example, at BRSF, CCDMs would only be allowed within the proposed movement corridor between the Blackwater Airfield and the STOP Camp (see Section [0](#)). Also, under Subalternative 1 there would be no blackout driving, emplacement of obstacles, bivouacking/establishment of assembly areas, or amphibious operations.

### **3.10.3.1 General Training Activity Impact Assessment Summary**

Based on the scope and nature of activities described in Chapter 2, no changes to land use designations are anticipated. However, several training activities could produce noise that may have a temporary, low-level impact on recreational users and landowners within the state forests. [Table 3-47](#) identifies potential interactions between Proposed Action effectors and land use receptors; these activities are shaded yellow and carried forward in Chapters [5](#) and [6](#) for detailed site-specific analysis. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

**Table 3-47. Receptors and Effector Interactions for Land Use Resources**

Effector	Land Use Resource Area Potentially Affected (Receptor)		
	Land Use Designations	Recreational Users	Landowners
Land Disturbance	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Overall, no anticipated impact to land use. Any required land-disturbing activities would be conducted in accordance with applicable guidelines and regulations. <b>Subalternative 1:</b> Same as the Proposed		
Land development			
Point impact			

**Table 3-47. Receptors and Effector Interactions for Land Use Resources, Cont'd**

Effector	Land Use Resource Area Potentially Affected (Receptor)		
	Land Use Designations	Recreational Users	Landowners
Incidental surface disturbance			
Consumption			
Ground Movement	<p>Although there is no anticipated impact, discussion of forest-specific hunting restrictions have been carried forward to respective forest chapters (BRSF: Chapter 5; THSF: Chapter 6). <b>Proposed Action:</b> Ground movement activities would be conducted in accordance with applicable guidelines and regulations. In addition, ground movements would be specifically timed in order to reduce or eliminate impacts to recreational users (including hunters) and landowners. Additionally, ground movements would avoid identified recreational sites and private property. <b>Subalternative 1:</b> Same as the Proposed Action, with the potential for impact less than the Proposed Action due to the reduced scope of activities proposed, especially with ground movement at BRSF limited to LZs/DZs and the movement corridor.</p>		
Wheeled vehicles			
Dismounted maneuver			
Use of Expendables	<p>This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential adverse impacts to land use have been identified associated with noise as a result of using expendables. <b>Subalternative 1:</b> Noise impacts, and resultant impacts to land use, would be less than the Proposed Action associated with the reduced level of proposed activity (no expendable use at THSF).</p>		
Blanks/GBS			
Smoke grenades			
Other/equipment			
Aircraft Operations	<p>This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential adverse impacts to land use have been identified associated with noise as a result of aircraft operations. <b>Subalternative 1:</b> Noise impacts, and resultant impacts to land use, would be less than the Proposed Action associated with the reduced level of proposed activity.</p>		
Amphibious Operations	<p>This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No anticipated impact. Amphibious Operations would be conducted in accordance with applicable guidelines and regulations. Amphibious Operations would be conducted in a manner to avoid public boaters and no power motors would be used in Bear Lake (BRSF). Since these activities would occur in uninhabited areas, no significant noise impacts to recreational users or landowners are anticipated. <b>Subalternative 1:</b> Same as the Proposed Action, with the potential for impact less than the Proposed Action due to the reduced scope of activities proposed.</p>		
Utilities	<p>This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No anticipated impact. Usage of utilities would not be expected to result in impacts to land use designations, recreational users, or landowners. <b>Subalternative 1:</b> Same as the Proposed Action, with the potential for impact less than the Proposed Action due to the reduced scope of activities proposed.</p>		

BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone; THSF = Tate's Hell State Forest

### 3.10.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section 3.10, no Resource-Specific Mitigations have been identified for land use in this chapter. Implementation of General Operational Constraints described in Section 2.5 would serve to minimize any identified adverse impacts.

## 3.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

Within the context of this EIS, "socioeconomic resources" refers to property values, economic activity, recreation and tourism, and the quality of life and health of the communities associated within the areas proposed for use as well as the surrounding areas. "Environmental justice" refers to the potentially affected populations that meet

certain characteristics based on race, income, and age. Each socioeconomic and environmental justice resource components is referred to as a “receptor.”

### 3.11.1 Impact Assessment Methodology

The impact assessment for socioeconomic and environmental justice evaluates the potential impacts of the Proposed Action and Subalternative 1 on socioeconomic and environmental justice receptors. Impacts to these resources are evaluated according to type, context, intensity, and duration (as described in Section [3.1](#)), as well as the regulatory drivers identified below. Together, these factors define the potential significance of the impacts.

#### 3.11.1.1 Regulatory Drivers

Laws and regulations applicable to the Proposed Action and Subalternative 1 for socioeconomic and environmental justice are summarized in this section.

- 40 CFR 1508.8, *Effects*, defines effects as either beneficial or detrimental, direct indirect, and cumulative and should include ecological, aesthetic, historic, cultural, economic, social or health (GPO 2014).
- 40 CFR 1508.14, *Human Environment*, discussion should consider all direct and indirect economic, social, and natural or physical environmental effects on the human environment (GPO 2014)
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities.
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

#### 3.11.1.2 Assessment Method

The assessment method described below was applied to socioeconomic and environmental justice receptors identified within the Proposed Action and Subalternative 1 ROIs as described in Sections [4.11.1](#), [5.11.1](#), and [6.11.1](#). There are no specific guidelines on assessment of socioeconomic resources but in general, any federal action that would result in a change in the spatial distribution of populations, spending patterns, employment, income, or public services would be considered an impact. Under the Proposed Action and Subalternative 1, there would be no change to populations; as a result, population impacts are not addressed in this EIS.

Analysis of impacts to environmental justice focused first on identifying potentially significant adverse impacts for any of the resource areas described in this EIS. If no potentially significant impacts to any populations were identified, environmental justice concerns were not considered further. For purposes of this EIS, the ROI for the environmental justice analysis is the county, which served as the area of concern (AC), and analysis focused on the demographics of specific affected populations for each of

the alternatives evaluated. If potentially significant impacts were identified, the percentage of low-income and minority persons and children under 18 were calculated for the ROI. These percentages were compared against the state averages, also referred to as the community of comparison (COC), to determine if the affected population is disproportionately composed of low-income and minority persons and children (i.e., has higher percentages).

Data relative to race and age were derived from the 2010 decennial census. For the purposes of this analysis, “children” were defined as persons age 17 and younger. The 2010 census does not contain any data relative to income; therefore, low-income populations were identified using data from the 2009–2013 American Community Survey (ACS) 5-year estimates. The ACS 5-year estimates constitute the most recent data set available from the Census Bureau that tabulates data relative to income at the census tract level of geography.

[Table 3-48](#) defines how the impact attributes of context, intensity, and duration are applied to socioeconomic and environmental justice analyses.

**Table 3-48. Definitions of Impact Attributes for Socioeconomics and Environmental Justice**

Attribute	Socioeconomics	Environmental Justice
Contexts Analyzed		
Regional	Impacts to populations within the region of Influence (typically considered the county) or beyond.	
Localized	Impacts to individuals within a certain geographical area smaller in size than the county (i.e., city, town, census tract, or block).	
Intensity (can be beneficial or adverse)		
High	Substantive and noticeable effect to socioeconomic characteristics that the market can adjust to over the long term, such as large number of jobs created or lost within a community. Extensive mitigations required to minimize adverse impacts; scope determined by context and duration of the impact.	Substantive and noticeable disproportionate effect to the health or economic conditions of minority, low-income, and youth populations as a result of significance threshold exceedance for identified resource areas (e.g., safety, land use). Extensive mitigations required to minimize adverse impacts; scope determined by context and duration of the impact.
Medium	Noticeable effect to socioeconomic characteristics that the market can adjust to within the short to medium term, such as increased incidental spending of military personnel during training activities or minor reduction in income over the medium to short term. Mitigations may be required to minimize adverse impacts; scope determined by context and duration of the impact.	Noticeable disproportionate effect to the health or economic conditions of minority, low-income, and youth populations that do not exceed resource-specific significance threshold criteria. Mitigations may be required to minimize adverse impacts; scope determined by context and duration of the impact.
Low	Minimal change in socioeconomic characteristics that the market can adjust to immediately. No mitigations required.	Minimal effect to the health or economic conditions of minority, low-income, and youth populations that is not disproportionate and does not result in exceedance of any significance thresholds. No mitigations required.
Neutral	No discernable effect to socioeconomic resource conditions.	No discernable effect to minority, low-income, or youth populations.
Duration		
Long term	Effect would likely endure for more than a year after the activity.	
Medium term	Effect would likely last for a few months to a year after the activity.	
Short term	Effect would likely last only for the duration of the activity.	



### 3.11.1.3 Impact Levels

The level of impact associated with socioeconomics and environmental justice and the impact's potential significance is determined by considering how Proposed Action/ Subalternative 1 effectors could interact with socioeconomics and environmental justice resources in terms of context, intensity, and duration as described in [Table 3-48](#). [Table 3-49](#) explains the impact level categories for socioeconomics and environmental justice resource categories analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-49. Impact Level Categories for Socioeconomics and Environmental Justice**

Level of Impact	Socioeconomics	Environmental Justice
Adverse	Adverse impacts may result in negative changes to socioeconomic characteristics such as job numbers or spending, the level of impact directly related to the impact attributes described in <a href="#">Table 3-48</a> . Adverse impacts may be perceived as significant under high-intensity scenarios of any duration that require long-term market adjustments and extensive mitigation. Insignificant impacts may occur under medium-intensity scenarios of any duration requiring medium- to short-term market adjustments and minimal mitigation.	Adverse impacts may affect the health or economic conditions of minority, low-income, or youth populations, the level of impact directly related to the impact attributes described in <a href="#">Table 3-48</a> . Adverse impacts may be perceived as significant under medium- to high-intensity scenarios of any duration resulting in substantive and noticeable disproportionate health or economic effects. Insignificant impacts may occur under low-intensity scenarios of any duration and have negative health or economic effects but they are not disproportionate and only require minimal mitigation.
Neutral/no effect	Activities do not result in adverse impacts to socioeconomic conditions and require no mitigation.	Activities do not result in adverse effects to the health or economic conditions of minority, low-income, or youth populations within the ROI.

ROI = region of influence

### 3.11.2 General Emitter Activity Impact Assessment

Socioeconomic and environmental justice impacts are relative to the site-specific location of the proposed emitter sites. In general, there would be minimal socioeconomic impacts associated with emitter activity. The FFS would benefit from additional revenue generated from the permit/lease fee. The permit/lease fee has yet to be negotiated between the Air Force and the FFS. Potential economic benefits associated with the increased revenue to FFS from the Air Force lease would likely be minor, and any localized spending of military during training activities is considered incidental and would not be significant. Potential impacts to the general public associated with safety and land use resulting from emitter placement and use are described in Sections [3.4](#) (*Safety*) and [3.10](#) (*Land Use*), respectively. These impact analyses, as well as potential environmental justice-related issues resulting from safety and land use impacts have been carried forward for site-specific analysis in Chapter [4](#).

### 3.11.3 General Training Activity Impact Assessment

#### Property Values

Private parcels are interspersed throughout the ROI. Many studies have reported a positive effect on sales prices of homes located near natural areas including parks and forest lands due to amenities such as convenient access to recreation and wildlife, less crowds, less noise, and less pollution. In addition, many studies have concluded that noise has a negative impact on property values. Certain UoEX and air operations have the potential to generate noise and wildfire risk which could impact property values adjacent to and nearby forest boundaries.

There are a number of factors that affect property values that make predicting impacts difficult. Factors directly related to the property, such as size, improvements, and the location of the property, as well as current conditions in the real estate market, interest rates, and housing sales in the area, are more likely to have a direct adverse impact on property values.

The majority of studies which assess the value of properties in proximity to forests focus on measuring the forest as a homogeneous entity which does not necessarily reflect the multiple-use management approach utilized by BRSF and other forest managers. A study by Ham et al. (2012) considers how property values are influenced when the proximity of a home to noisy activities (i.e. active timber management or motorized recreation areas) versus non-noisy activities (i.e. wildlife habitat or hiking trails) is taken into consideration. The results suggest that there is a premium for homes within a given distance of the nearest forest boundary but a decrease in the price for homes closer to noise-intense activities occurring in the forest.

Several studies have been conducted analyzing property values as they relate to military and civilian aircraft noise. One study conducted a regression analysis of property values as they relate to aircraft noise at two military installations (Fidell et al., 1996). This study found that while aircraft noise at these installations may have had minor impacts on property values, it was difficult to quantify those impacts because other factors, such as the quality of the housing near the installations and the local real estate market, had a larger impact on property values. Therefore, the regression analysis was not able to predict the impact of aircraft noise on the property values of two comparable properties.

In a study performed by Nelson (2003), the author analyzed 20 different property value studies that attempted to quantify the impact of noise on property values (Nelson, 2003). Nelson (2003) also analyzed the values of similar properties, using one property located near a source of noise, specifically an airport, and one property not located near a source of noise. The result of the study is that, considering all other factors (e.g., neighborhood characteristics and desirability, local real estate market conditions, school districts) as equal, an adverse impact on property values as a result of aircraft noise is possible and estimates that the value of a specific property could be discounted between 0.5 and 0.6 percent per decibel when compared with a similar property that is not impacted by aircraft noise. However, additional indications are that the discount for property values as a result of noise would be higher for noise levels above 75 dB DNL (Nelson, 2003).

Implementation of General Operating Constraints outlined in Section [2.5](#) would restrict noise-intensive activities around NSAs such as residential parcels to minimize the potential impact to property values.

In general, studies suggest that the risk of wildfires on housing prices would be similar to other natural hazards in which housing prices would drop immediately after an event and the effect would diminish over time. A study by Donovan et al. (2007) reveals that when assessing wildfire risk on a property's value, it is important to take into consideration the natural amenities in the area since in many cases, the presence of natural amenities outweighs the risk of wildfire, particularly to those with less information regarding their potential risk. If a wildfire would occur due to the activities associated with the Proposed Action, it would be anticipated that the housing market would be impacted immediately following the event but would eventually diminish over time. While the risk of wildfire is greater with the use of expendables during training, implementation of wildfire prevention requirements as identified in Section [3.4](#) would minimize potential wildfire occurrences at BRSF.

Implementation of General Operational Constraints, described in Section [2.5](#), would determine restrictions on noise-generating expendable use and overflights, require buffers around residential structures, and would require implementation of training SOPs, safety measures, and avoidance of the general public. Under these conditions, it is not expected that the change in noise levels or risk of wildfire from general training activities would impact property values. However, as discussed in Section [3.3](#), the residents affected by the noise levels may be annoyed by overflights.

### **Economic Activity**

The FFS has many sources of revenue. Recreational activities on the forests are the second major source of revenue following timber activities. Thus, any adverse impact on recreational activities that would impact the number of users or dollars spent on tourism to the forests would also adversely affect the budget for management of the forests. The FFS would benefit from additional revenue generated from the permit/lease fee. The permit/lease fee has yet to be negotiated between the Air Force and the FFS. To minimize adverse impacts to competing users of the forest, Eglin AFB would coordinate with the FFS to identify time and area constraints for training activities (e.g., avoidance of specific hunting seasons and associated areas) and incorporate these constraints into unit training plans. Implementation of this and other general operating constraints (Section [2.5](#)) would minimize conflicts between competing users of the forest and revenue generating activities.

### **Recreation and Tourism**

Recreation and tourism activities are a large economic contributor for the local area. In particular, "ecotourism" is becoming the fastest growing segment of the tourism industry. Certain ground operations, UoEX, and air maneuver training activities have been identified as resulting in potentially adverse recreation and tourism impacts due to the noise and safety issues associated with these activities. Noise and safety concerns could have an adverse impact on the quality of the environment or outdoor experience. Noise and safety impacts related to the training activities have been identified as

adverse but not significant due to the assessment that these impacts are typically recoverable over the short-to-medium term when mitigations, required to minimize the level of impact or potential for impact, are implemented. However, in the event that a visitor does have an undesirable experience due to the proposed training activities, there would be potential for that visitor to not return to the area. If negative experiences associated with the Proposed Action become frequent and shared by an increasing number of visitors, the FFS and, potentially, local businesses could experience a loss of revenue from a decrease in the number of first time and repeat visitors. This in turn would likely have an effect on the total employment in the tourism industry. Implementation of General Operational Constraints identified in Section [2.5](#) would be anticipated to minimize the potential for significant impacts to local businesses. Subalternative 1 would restrict the locations, times, and frequency the military users would be allowed to train in the forests to further minimize any potential interference or noise generated as a result of military actions that would influence the number of visitor trips to the state forests.

### **Quality of Life and Health**

The Environmental Protection Agency (EPA) along with other federal governments and agencies have acknowledged that there exists a positive relationship between being in nature or partaking in outdoor recreation and physical and emotional health (EPA 2012). Physical and emotional health is also linked to an individual's perceived quality of life.

Certain ground and air maneuver training activities associated with the Proposed Action would likely result in a temporary disturbance or annoyance from noise to recreational users of the state forest. An indirect health effect of exposure to noise is the potential psychological effects that correlate with intensity of the noise. Noise impacts to recreational users and adjacent landowners would be minimized through implementation of General Operational Constraints identified in Section [2.5](#) and avoidance of established recreational sites and residential parcels. Although noise impacts can be minimized, the Air Force recognizes that noise cannot be completely avoided due to the transient nature of training activities and recreational users and the varying tolerance among members of the public. While the impacts associated with training are considered adverse due to the potential varying perceptions of physical and emotional health of recreational users exposed to noise, the training activities would not preclude recreational use or cause general incompatibility. Furthermore, Subalternative 1 would serve to minimize the potential for impact due to the decreased scope of activities.

### **Environmental Justice and Special Risks to Children**

Environmental justice impacts and special risks to children may result from noise, safety, and land use impacts as described in Sections [3.3](#) (*Noise*), [3.4](#) (*Safety*), and [3.10](#) (*Land Use*), respectively. No other significant impacts for this action have been identified that would impact environmental justice or pose special risks to children.

### 3.11.3.1 General Training Activity Impact Assessment Summary

Based on the scope of action described in Chapter 2, most training activities would have at least some interaction with socioeconomics and environmental justice resources. [Table 3-50](#) identifies potential interaction between Proposed Action and Subalternative 1 effectors and socioeconomics and environmental justice resource receptors. Activities shaded in yellow have the potential to impact the public health and safety and/or the human and natural environment and are carried forward for detailed analysis in Chapters 5 and 6. Activities shaded green have little potential to impact public health or safety and/or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters 5 and 6.

**Table 3-50. Receptor and Effector Interactions for Socioeconomics and Environmental Justice**

Effector	Resource Area Potentially Affected (Receptor)						
	Socioeconomics				Environmental Justice		
	Property Value	Economic Activity	Recreation and Tourism	Quality of life and health	Minority	Low-Income	Youth
Land Disturbance							
Land development	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There would be minor land development activities associated with installation of fencing and possible tree topping/clearing for emitter sites; this would not be expected to result in any adverse socioeconomic impacts. There are no land development activities associated with the training. <b>Subalternative 1:</b> Same as the Proposed Action.						
Point impact	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There would be no interaction with socioeconomic resources associated with these activities. <b>Subalternative 1:</b> Same as the Proposed Action.						
Incidental surface disturbance							
Consumption							
Ground Movement							
Wheeled vehicles	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Minimal-to-no noise and safety impacts have been identified that would effect transient users or residences resulting in impacts to socioeconomic resources and minority, low-income, or youth populations. Ground movements would avoid inhabited recreational sites and private property. The Air Force has not identified any adverse impacts to socioeconomic resources and environmental justice areas of concern associated with these activities. <b>Subalternative 1:</b> Impacts would be relatively the same as the Proposed Action, with the potential for impact occurrence being substantially less due to the reduced scope of activities (less number of operations, location limitations, etc.)						
Dismounted maneuver							
Use of Expendables							
Blanks/GBS	This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for adverse impacts associated with disturbance from noise and safety concerns to the public have been identified. <b>Subalternative 1:</b> The Air Force has not identified any adverse impacts to socioeconomic resources or environmental justice populations associated with these activities. UoEX would only be allowed at hardened camp sites at BRSF, which would be leased to the Air Force for exclusive use. No UoEX would occur on THSF under this alternative that could impact socioeconomic resources or minority, low-income, and youth populations.						
Smoke grenades							
Other/equipment							



**Table 3-50. Receptor and Effector Interactions for Socioeconomics and Environmental Justice, Cont'd**

Effector	Resource Area Potentially Affected (Receptor)						
	Socioeconomics				Environmental Justice		
	Property Value	Economic Activity	Recreation and Tourism	Quality of life and health	Minority	Low-Income	Youth
Aircraft Operations	This issue has been carried forward for site-specific analysis. <b>Proposed Action:</b> Potential for disturbance from noise to the public have been identified that could adversely impact socioeconomic resources and environmental justice areas of concern. <b>Subalternative 1:</b> Same as the Proposed Action, although the potential for noise impacts is limited based on the reduced scope of Subalternative 1 activities.						
Amphibious Operations	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction between this activity and these resource areas has been identified. <b>Subalternative 1:</b> This activity would not occur under Subalternative 1, therefore no impacts have been identified.		This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified. Impacts to the public associated with disturbance from Amphibious Operations would be similar to ongoing boating activity in the area. <b>Subalternative 1:</b> This activity would not occur, therefore no impacts have been identified.		This issue area has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction between this activity and these resource areas has been identified. <b>Subalternative 1:</b> This activity would not occur, therefore no impacts have been identified.		
Utilities	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction between this activity and these resource areas has been identified. <b>Subalternative 1:</b> Same as the Proposed Action.						

#### 3.11.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section [3.11](#), Proposed Resource-Specific Mitigations would be the same as those identified in Sections [3.3](#) (*Noise*), [3.4](#) (*Safety*), and [3.10](#) (*Land Use*).

### 3.12 SOLID AND HAZARDOUS MATERIALS/WASTE

This discusses the generation and management of solid and hazardous materials and wastes associated with the activities under the Proposed Action.

#### 3.12.1 Impact Assessment Methodology

The analyses focused on how and to what degree the Proposed Action and Subalternative 1 would affect hazardous materials management and solid waste generation and management. The debris from range operations was calculated based on the types of ordnance used.

##### 3.12.1.1 Regulatory Drivers

The following primary standards and regulations apply to solid and hazardous materials/wastes as it relates to the Proposed Action:

- Resource Conservation and Recovery Act (RCRA), USC Title 40 CFR, Parts 239 to 282, 42 USC 6901 et seq.: RCRA is the primary law governing the disposal of solid and hazardous waste. RCRA established three distinct, yet interrelated, programs. First, the solid waste program, under RCRA Subtitle D, encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities, and prohibits the open dumping of solid waste. Second, the hazardous waste program, under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal—in effect, from “cradle to grave.” Third, the underground storage tank (UST) program, under RCRA Subtitle I, regulates USTs containing hazardous substances and petroleum products.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC Chapter 103: CERCLA, commonly known as Superfund, created a tax on the chemical and petroleum industries and provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.
- Florida Solid and Hazardous Waste Management Act, Florida Statutes 29 Chapter 403: Requires that counties establish and operate solid waste disposal facilities and that each county implement a recycling program to achieve reduction in the levels of solid waste disposed.
- Florida Resource Recovery and Management Regulations, Florida Administrative Code (FAC) 67.2: Establishes local resource recovery and management programs and regulates the collection, transport, storage, separation, processing, recycling, and disposal of solid wastes.
- AFI 32-7042, *Solid and Hazardous Waste Compliance*: Establishes municipal solid waste management and compliance. In general, AFI 32-7042 establishes the requirements for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record keeping and reporting; and pollution prevention.
- AFI 32-7080, *Pollution Prevention Program* - Addresses source reduction, resource recovery, and recycling of solid waste.
- Eglin AFB Instruction 32-7042, *Eglin AFB Hazardous Material Management Process* - Establishes hazardous materials management practices for all Eglin AFB organizations and tenants.
- Eglin AFB Instruction 32-7003, *Eglin AFB Hazardous Waste Management Plan* - Identifies hazardous waste generation areas and addresses proper packaging, labeling, storage and handling, record-keeping, spill contingency and response requirements, and education.

### 3.12.1.2 Assessment Method

Potential impacts related to hazardous materials and hazardous wastes are analyzed for the following effects.

- 1) Generation of waste types or quantities that cannot be accommodated by the current management system. The analysis methodology identifies activities associated with the Proposed Action and, using process knowledge or other available data, predicts the type and quantity of wastes that would likely be generated from these activities. These data are compared with current generation rates, waste types, and capability for managing wastes to determine the resulting effects. It is assumed that proposed activities would not result in the generation of hazardous wastes. Additionally, it is assumed that metallic debris (e.g., brass cases) from training operations would be recycled and, therefore, not disposed of as solid waste.
- 2) An increased likelihood of an uncontrolled release of hazardous materials that could contaminate soil, surface water, groundwater, or air, from the release of chemicals used in training activities. The analysis methodology first reviews the types and quantities of hazardous materials that would be used (fuel, expendables, etc.) and evaluates the potential for the release of these materials, and associated amounts, into the environment. Potential impacts from chemical releases to specific media (i.e., soil, water, air, biological resources) are discussed in each of those respective sections.

[Table 3-51](#) defines how the impact attributes of context, intensity, and duration are applied to biological resource analyses.

**Table 3-51. Definitions of Impact Attributes for Solid and Hazardous Materials/Waste Resource Categories**

Attribute	Chemical Releases	Waste Generation
Contexts Analyzed		
Regional/population	County level, state park level, or management unit level effects; impacts to populations.	
Localized	Less than management area effects; impacts to individuals.	
Intensity (can be either adverse or beneficial)		
High	Substantive increase or decrease in chemical release that results in a relative decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include increases in existing releases and/or introduction of new releases at reportable quantity levels <sup>1</sup> where there were none previously or discontinuation of actions currently resulting in reportable quantity releases.	Substantive increase or decrease in waste generation that results in a relative change in the waste management system. Examples may include increases in existing or introduction of new solid or nonacute and/or acute hazardous waste streams where there were none previously and that cannot be managed by the current waste management system without new or additional waste management procedures, or elimination of several solid or nonacute or acutely hazardous waste streams.
Medium	Moderate increase or decrease in chemical release that results in a relative decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include increases in existing releases and/or introduction of new releases under reportable quantity levels or a reduction in baseline chemical releases to quantities below reportable levels.	Moderate increase or decrease in waste generation that results in a relative change in the waste management system. Examples may include increases in existing or introduction of new, nonacute hazardous or solid waste streams where there were none previously and that can be accommodated by the existing management system with some procedural modification or reduction in quantities of baseline hazardous or solid waste generation.

**Table 3-51. Definitions of Impact Attributes for Solid and Hazardous Materials/Waste Resource Categories, Cont'd**

Attribute	Chemical Releases	Waste Generation
Low	Slight increase or decrease in chemical release that results in no perceptible decline or improvement in baseline chemical releases to soil, surface water, groundwater, or air. Examples include small increases in existing releases that are currently under reportable quantity levels, or a small reduction in baseline chemical releases, neither of which result in noticeable impacts.	Slight increase or decrease in waste generation that results in no perceptible change in the waste management system. Examples may include small increases in existing nonacute hazardous or solid waste streams that can be accommodated by the existing management system with no procedural modification or reduction in quantities of baseline hazardous or solid waste generation, neither of which results in noticeable impacts.
Neutral	No chemical release or waste impacts.	
Duration		
Long term	Effect would likely endure for the life of the action.	
Medium term	Effect would likely last for a few months to a year.	
Short term	Effect would likely last for a few days to weeks.	

EPCRA = Emergency Planning and Community Right-to-Know Act

1. Reportable releases are those chemical releases in that exceed applicable reporting threshold quantities established under EPCRA.

### 3.12.1.3 Impact Levels

This section addresses the potential for the Proposed Action to pose adverse risks from chemical release, as well as the Air Force's capability to manage these risks and manage solid/hazardous waste generation. The level of impact associated with solid and hazardous waste and the impact's potential significance is determined by considering how Proposed Action effectors could interact with solid/hazardous waste generation and management in terms of context, intensity, and duration as described in [Table 3-41](#). [Table 3-52](#) explains the impact level categories for solid and hazardous materials/waste analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-52. Impact Level Categories for Solid and Hazardous Materials/Waste Resources**

Level of Impact	Solid & Hazardous Materials/Waste Receptors
Adverse	Adverse impacts may result from a chemical release of hazardous materials or the generation of solid/hazardous waste types or quantities, the level of impact directly related to the impact attributes described in <a href="#">Table 3-51</a> . Adverse impacts may be perceived as significant under high- to medium-intensity scenarios of any duration if proposed activities resulted in a high potential for uncontrolled chemical releases to the environment or the generation of wastes that could not be managed by the current system. Insignificant impacts may occur under medium-intensity scenarios of any duration and result in nonreportable chemical releases but chemical exposures to military personnel, the public, or the environment are adequately controlled by means of established procedures. For solid/hazardous waste, activities may result in the generation of large but manageable waste types or quantities requiring only some management adjustments.
Neutral/no effect	Activities do not result in a perceptible increase in chemical release potential, do not change baseline releases, or result in adverse chemical exposures. Solid/hazardous waste generation amounts may be reduced or may be similar to the baseline condition.

### 3.12.2 General Emitter Activity Impact Assessment

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to this resource. Operation of the emitters would not result

in potential releases of hazardous chemicals or the generation of appreciable solid or hazardous wastes.

No hazardous materials or hazardous or petroleum wastes would be generated at most FFS sites or at the two FWC sites, because no industrial activities would occur at these sites. The only exceptions are the Molino, Youngstown, and White City sites. At these locations, personnel would perform limited maintenance of vehicles and equipment, primarily consisting of oil and fluid changes. Consequently, hazardous materials stored at these sites include small quantities (55-gallon containers or smaller) of lubricating oil, hydraulic fluid, antifreeze, solvents, and paints. All materials and wastes would be managed according to established FFS requirements. These requirements include the use of secondary containment and the availability of spill response equipment.

Emitter activity would be expected to result in neutral levels of solid waste (minimal improvements required, some solid waste from personnel). The primary hazardous material associated with this activity is POLs, used for fuel and lubrication of parts. Use of these items may result in generation of small amounts of POLs and associated waste, such as contaminated rags. Use of POLs, and disposal of associated wastes, would be conducted according to established procedures as described under Section [3.12.1.1](#), which would minimize the potential for associated spills. As a result, the Air Force anticipates no adverse impact to public health or safety or the human and natural environment or potential violations of federal, state, or local regulations. Therefore, this issue has not been not carried forward for site-specific analysis in Chapter [4](#).

### 3.12.3 General Training Activity Impact Assessment

Based on the scope of action described in Chapter [2](#), examples of potential debris generated during training include:

- Shell casings, canisters from signal smokes, etc.
- Unexploded ordnance (UXO) (primarily inert items)
- Litter and refuse from daily mission activities, including ground troop movement

Most ground training on foot (dismounted maneuver) would involve movement without leaving any evidence of troop presence. Impacts from litter or refuse are not anticipated if the following mitigations are adhered to:

- Pack out debris and refuse packed in or properly dispose of litter (FAC 62-701).
- Remove and properly dispose of solid debris from blanks, GBSs, and smokes in accordance with Eglin AFB operating procedures.
- Conduct post-mission surveys to ensure debris has been removed.

Based on the above, and the scope of action described in Chapter 2, the following proposed activities are not discussed further under this resource area: utilities (which would have no interaction with hazardous or solid materials and waste) and dismounted maneuver.

Under Subalternative 1 expendable usage would be limited to the hardened camp sites at BRSF.



### ***Land Disturbance***

Impacts to solid and hazardous materials/waste may occur as a result of solid waste/debris deposited on the surface of terrestrial or aquatic environments during land disturbance activities. As discussed in Chapter 2, any land disturbance would be minimal in nature, and it is not anticipated that land disturbance activities would generate a need for disposal of soil and woody waste. As with emitter use, utilization of POLs for equipment could result in chemical releases and hazardous waste generation. However, use of POLs, and disposal of associated wastes, would be conducted according to established procedures as described under Section 3.12.1.1, which would minimize the potential for spills associated with these types of operations. As a result, the Air Force anticipates no adverse impacts associated with chemical releases or generation of solid or hazardous wastes from land disturbance activity.

Units would use chemical latrines for human waste disposal whenever possible during field training missions. These toilets are self-contained in that they have a holding tank with chemical additives to aid in decomposition of the waste and for odor control. The contents would be pumped out as required for disposal in a conventional sanitary waste water system. When chemical latrines are not available, a cat-hole latrine or saddle trench latrine would be used in accordance with service command directives. These must be constructed to prevent the contamination of food and water. They would be located at least 100 feet from any unit groundwater source. For further protection, latrines would not be dug to the groundwater level or in places where pit contents may drain into the water source. Members of the military will be instructed to avoid recreational areas and stay at least 200 feet from streams, lakes and surface waters when going to the bathroom.

Under Subalternative 1, the potential for impacts from land disturbance would be lessened over those under the Proposed Action, as cross country dismounted movement would occur only over a narrow corridor, and would avoid streams or wetlands.

### ***Ground Movement (Wheeled Vehicles), Aircraft Operations, and Amphibious Operations***

Impacts from these activities are associated with petroleum leaks or spills from the operation or fueling of vehicles, aircraft, or watercraft.

Established refueling protocols and BMPs would be followed during vehicle operation or refueling activities. These protocols include making spill response kits (pads and booms) available on vehicles. Personnel would also be trained on how to respond to/clean up potential spills, which includes containing any spills with pads, booms, etc. Post-spill activities may also include removing any contaminated soils and replacing these with clean fill. Within four hours of the spill event, a spill response form must be sent to the Eglin AFB Compliance Branch (96 CEG/CEIEC). Implementation of established vehicle operation and refueling protocols and BMPs would preclude the potential for any adverse environmental impacts.

Under Subalternative 1, the potential for impacts associated with these operations would be lessened over those under the Proposed Action, as wheeled vehicle movement would occur only over existing roads and amphibious operations would not occur.

### UoEX

A primary impact to solid and hazardous materials/waste would be associated with a release of chemical materials to the environment. These materials encompass liquid, solid, or gaseous substances released to the environment as a result of mission activities and include expendables combustion by-products, fuel or oil leaks or spills, and untreated bilge release from watercraft.

To mitigate potential chemical releases, Eglin AFB has implemented a comprehensive Hazardous Material Management Process. Hazardous materials management is guided by AFI 32-7042 (U.S. Air Force, 2009). All Eglin AFB organizations and tenants are required to follow this plan. In addition, Eglin has implemented a Hazardous Waste Management Plan, Eglin AFB Instruction 32-7003. This plan identifies hazardous waste generation areas and addresses proper packaging, labeling, storage and handling, record keeping, spill contingency and response requirements, and education. Procedures and responsibilities for responding to a petroleum spill or other incident are also described in the Eglin AFB *Spill Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2005b).

Expendables training operations would be conducted twice per quarter during a 24-hour period and would involve 6 to 12 personnel. They would include movement from insertion points to objective sites and dismounted travel through training areas.

The *Eglin AFB Interstitial Area Final Programmatic Environmental Assessment* (U.S. Air Force, 1998c) analyzed the environmental impact of increasing yearly ground troop movement in interstitial spaces from 55,800 troops per year (1997) to 167,500, equal to a 200 percent increase. No adverse environmental impacts associated with chemical releases or solid/hazardous waste were determined from the 200 percent increase in ground troops regarding debris and the use of blanks, smokes, and flares during ground troop training activities in Eglin AFB training areas.

The *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c) documented chemical releases from the UoEX of the same quantity and types as are associated with the current Proposed Action. [Table 3-53](#) summarizes the associated annual release of chemical constituents from the use of these expendables.

**Table 3-53. Expendables-Related Residue**

Chemical	Annual Quantity Generated (pounds)
Antimony	5
Barium	8
Chromium	3
Hydrochloric acid	79
Lead	8

Source: U.S. Air Force, 2009

The chemical load from all expendables, as summarized in the table, would be distributed over all training areas. Therefore, the overall concentration of any chemical at any given location would be minute. Consequently, no significant adverse impacts are associated with the release of chemicals from the proposed UoEX.

Releases to the environment from expendables used in proficiency and qualification training require reporting to the USEPA under the Emergency Planning and Community Right-to-Know Act (EPCRA) Toxics Release Inventory (TRI) program. Training is

subject to a TRI reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as persistent bioaccumulative toxic. These chemicals include mercury, with a reporting threshold of 10 pounds, and lead, with a threshold of 100 pounds. In cases when a threshold is exceeded, the installation must report on a “Form R” report to the USEPA the quantity of munitions-related waste released to the environment or recovered and recycled. Eglin AFB has procedures to comply with TRI reporting requirements and would track expendables use associated with the proposed activities. Potential impacts could result if proposed training activities would result in reporting thresholds being exceeded at Eglin AFB for any new chemicals. Based on the quantity of chemicals that would be released as part of proposed activities, no new TRI thresholds would be exceeded and no additional TRI reporting would be required by Eglin AFB.

Additionally, troops would be required to recover shell casings and other expendable by-products (e.g., GBS canisters) from the training sites to the extent practicable. While it would not be feasible to collect every casing or other expendable by-product, the amount that may be missed or left behind would be minimal. The *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c) addresses impacts under similar circumstances and found that there would be no significant impacts. Consequently, given the amount of expendables would be lower at the state forests than that represented in analyses for Eglin AFB, the Air Force expects that the minimal amount of expendable by-products that may be missed as part of troop recovery processes at the state forests would result in minimal impacts to the environment.

The Air Force may also use paintballs during training. No adverse impacts from the use of paintballs are anticipated. A typical biodegradable paintball contains gelatin, glycerol, sorbitol, polyethylene glycol, and food-grade dyes. The compounds are edible, fit for human consumption, and metabolized by most aquatic and terrestrial organisms.

Under Subalternative 1, the potential for impacts associated with UoEX would be lessened over those under the Proposed Action, as UoEX would be limited to the hardened camp sites at BRSF; there would be no UoEX at THSF.

### 3.12.3.1 General Training Activity Impact Assessment Summary

[Table 3-54](#) summarizes potential interactions between Proposed Action effectors and resource effectors. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters [5](#) and [6](#).

**Table 3-54. Receptor and Effector Interactions for Solid and Hazardous Materials/Waste Resources**

Effector	Hazardous/Solid Materials/Waste Receptor	
	Chemical Release	Waste Generation
Land Disturbance		
Land development	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No effect associated with chemical releases. Land development activities would be minimal and result in minor potential for petroleum leaks/releases from construction equipment during use and fueling; these are avoided through	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No effect associated with waste generation. Land development activities would be minimal and result in relative waste amounts. Any wastes would be recycled on site. <b>Subalternative 1:</b> Impacts would less than those of Proposed

**Table 3-54. Receptor and Effector Interactions for Solid and Hazardous Materials/Waste Resources, Cont'd**

Effector	Hazardous/Solid Materials/Waste Receptor	
	Chemical Release	Waste Generation
	implementation of SOPs/BMPs discussed previously. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	Action, as operations would be limited in scope and/or geographic area.
Point impact	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> These activities do not involve the use of hazardous materials nor would they result in the generation of hazardous waste. There may be small amounts of solid waste produced by personnel during these activities. However, the Air Force does not expect these activities to result in adverse impacts, due to the small amounts potentially generated and the requirement for personnel to pick up any litter generated. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There is a minor potential for petroleum leaks/releases from vehicles during operation and fueling. However, this potential is minimized through implementation of SOPs/BMPs discussed previously. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Little potential for impacts; any wastes generated (such as rags or oil cans) would be collected and disposed of according to previously described SOPs/BMPs. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.
Dismounted maneuver	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would be expected to have no effect on the hazardous material environment for military personnel or the general public. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity has potential for litter and refuse from daily mission activities. However, as previously discussed, personnel would be required to pick up and litter and “leave no trace.” As a result, the Air Force anticipates no adverse waste impacts. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.
Use of Expendables		
Blanks/GBS	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There is a negligible potential for impacts. While release of hazardous constituents during utilization (e.g., detonation process) would occur use would be infrequent and distributed over a wide area. As discussed in the Eglin Interstitial Range Environmental Assessment, use of these items at much higher quantities and frequencies was found to have no adverse impact. Releases would not result in reportable quantities. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	This issue has not been carried forward for site specific analysis. <b>Proposed Action:</b> Utilization of these expendables would result in generation of metallic (e.g., brass casings) and plastic debris. However, as discussed previously, personnel would be required to collect this debris post training. As a result, the Air Force anticipates no adverse impact. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.
Smoke grenades		
Other/equipment	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> Use of other equipment (generators, etc.) has a minor potential for petroleum leaks/releases during operation and fueling, as well as generation of wastes such as rags or oil cans. However, these are avoided through implementation of SOPs/BMPs discussed previously. Consequently, the Air Force expects	

**Table 3-54. Receptor and Effector Interactions for Solid and Hazardous Materials/Waste Resources, Cont'd**

Effector	Hazardous/Solid Materials/Waste Receptor	
	Chemical Release	Waste Generation
	no adverse impacts. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	
Aircraft Operations	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> There is a minor potential for petroleum leaks/releases from aircraft and boats during operation. However, this potential is minimized through implementation of SOPs/BMPs discussed previously. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	
Amphibious Operations		
Utilities	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> This activity would not result in chemical releases or wastes and would be expected to have no effect. <b>Subalternative 1:</b> Impacts would less than those of Proposed Action, as operations would be limited in scope and/or geographic area.	

BMP = best management practice; SOP = standard operating procedure

### 3.12.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section 3.12, no Resource-Specific Mitigations have been identified. Implementation of General Operational Constraints described in Section 2.5 would serve to minimize the potential for any adverse impacts.

## 3.13 INFRASTRUCTURE AND TRANSPORTATION

“Infrastructure” refers to the system of public works, such as utilities and transportation that provides the underlying framework for a community. Utilities typically consist of the services and facilities that supply electricity, potable water, wastewater treatment, and natural gas. Transportation infrastructure includes the public roadway network, public transportation systems, airports, railroads, pedestrian/bicycle facilities and waterborne transportation required for the movement of people, materials, and goods. Each of these utility and transportation resource components is referred to as a “receptor.”

### 3.13.1 Impact Assessment Methodology

The impact assessment for infrastructure evaluates the potential impacts of the Proposed Action on utilities and transportation resources. Impacts to these resources are evaluated according to type, context, intensity, and duration (as described in Section 3.1). Together, these attributes define the potential significance of the impacts.

#### 3.13.1.1 Regulatory Drivers

There are no applicable regulatory drivers for infrastructure and transportation resources.



### 3.13.1.2 Assessment Method

Impacts to utilities and transportation were assessed with respect to the potential for disruption, degradation, or improvement of existing utility systems and roadways, changes in demand for energy or water resources, deterioration or improvement of existing levels of service, and changes in existing levels of utility and transportation safety. Impacts may arise from physical changes to utility corridors, construction activity, change in demand for services from changes in personnel, and increased utilization of existing roadways. [Table 3-55](#) defines how the impact attributes of context, intensity, and duration are applied to utility and transportation resource analyses.

**Table 3-55. Definitions of Impact Attributes for Infrastructure**

Attribute	Utilities	Transportation
Contexts Analyzed		
Regional/ population	Large-scale power generation plants and interstate power or natural gas distribution systems, water and wastewater treatment systems that serve the region or large counties.	Interstate, U.S., or state highways.
Localized	Small individual or municipal utilities and infrastructure (e.g., city water or wastewater treatment plant, individual water wells and septic systems, local power, water, sewer, and gas lines).	County or local roads and streets, road network within BRSF or THSF.
Intensity (can be either adverse or beneficial)		
High	Substantive change in average and peak utility use associated with the Proposed Action. Major new utility construction and/or upgrades to existing utility infrastructure.	Substantive change in traffic volume and/or major new road construction/improvements that have major effects and changes on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways.
Medium	Moderate change in utility use and demand. Minor new utility construction and/or upgrades to existing utility infrastructure.	Moderate change in traffic volume and/or new road construction/improvements that have a limited effect on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways. New road construction/improvements
Low	Negligible change in utility use and demand that could be easily accommodated by existing systems. Existing utility connections could be upgraded or added, but construction of new utility infrastructure would not occur.	Negligible change in traffic volume and/or small road construction/improvement projects that have little effect on the operational characteristics, level of service, circulation patterns, and safety of the affected roadways.
Neutral	No apparent change in operational condition of the resource.	
Duration		
Long term	Effects would be permanent or endure for the operational life of the action or until improvements could be made or new infrastructure constructed to accommodate increased use and demand.	
Medium	Depending on seasonal periods of use and demand, effects would likely last for a few months. New construction and improvements could last for a few months to a year.	
Short term	Effects would likely last for a few days to a week only during times of activity associated with the action.	

BRSF = Blackwater River State Forest; THSF = Tate's Hell State Forest

### 3.13.1.3 Impact Levels

The level of impact associated with infrastructure and the impact's potential significance is determined by considering how Proposed Action effectors could interact with utilities and transportation resources in terms of context, intensity, and duration as described in [Table 3-55](#). [Table 3-56](#) explains the impact level categories for utilities and transportation resources analyzed in this EIS and identified in Chapters [4](#), [5](#), and [6](#).

**Table 3-56. Impact Level Categories for Infrastructure**

Level of Impact	Utilities	Transportation
Adverse	<p>Adverse utility impacts may result in changes to existing utility infrastructure, use, or demand, the level of impact directly related to the impact attributes described in <a href="#">Table 3-55</a>. Adverse impacts may be perceived as significant under high-intensity scenarios of long duration where an increase in average and peak utility use and demand is beyond the capacity of existing utility infrastructure. Major system upgrades that are beyond those projected by the utility system in their capital improvements plans could be necessary to maintain existing level of service. Insignificant impacts may occur under medium-intensity scenarios of any duration and result in:</p> <ul style="list-style-type: none"> <li>• A violation of a permit condition or contract with a utility provider.</li> <li>• Deterioration or interruption of existing utility services.</li> <li>• Physical changes to utility plants and corridors from upgrades and construction of new infrastructure.</li> </ul> <p>Moderate increases in utility use and demand could be met by existing utility systems. However, future use/demand could be limited due to the lack of excess capacity unless upgrades or new infrastructure are added.</p>	<p>Adverse transportation impacts may result in traffic volume and/or new road construction/improvements, the level of impact directly related to the impact attributes described in <a href="#">Table 3-55</a>. Adverse impacts may be perceived as significant under high-intensity scenarios of long duration resulting in:</p> <ul style="list-style-type: none"> <li>• Increased traffic volumes at or above a roadway's full design capacity causing a reduction in level of service and major congestion and traffic delays.</li> <li>• Accident rate increases greater than the average range of accidents on similar roadways.</li> <li>• Major deterioration of roadway surfaces beyond normal conditions or wear rates.</li> <li>• The need for major roadway construction and/or upgrades beyond those projected and funded by federal, state, or local agencies.</li> </ul> <p>Insignificant impacts may occur under medium- to low-intensity scenarios of any duration negatively affecting traffic congestion and accident rates during peak travel times but not necessarily leading to a change in level of service. Additional traffic might also contribute to increased roadway deterioration. New roadway construction/improvements could cause temporary traffic delays and temporary road closures until activities are completed.</p>
Neutral/no effect	<p>Activities do not require utility upgrades or new infrastructure because utility use/demand is unchanged or remains close to baseline conditions.</p>	<p>Activities have no effect on circulation, traffic congestion, and accident rates and existing transportation resources are unchanged or unaffected from normal conditions.</p>

### 3.13.2 General Emitter Activity Impact Assessment

#### *Proposed Action / Subalternative 1 (Preferred Alternative)*

Based on the scope of action described in Chapter 2, emitter site use would not be expected to result in impacts to utilities or transportation resources. All of the proposed emitter locations are improved or semi-improved sites and, except for FWC-2 and FWC-2 (Subalternative 1), have on-site electrical power available. Water and telephone service is available at all of the locations except FWC-1, FWC-2, and FWC-3. Four of the locations (EAFB-1, FFS-5, FFS-6, and FFS-7) also have fiber optic service

available. Power generation for the different types of emitters would be provided either by generator or connection to the existing electrical system. Water would either be supplied through the available on-site sources or could be brought in as needed. If latrines are not available on-site, portable toilets could be utilized during training activities. Transport of the various emitters to the emitter sites would only require occasional trips utilizing a small number of transport and support vehicles and would not adversely impact any of the roadways that would be used. Based on the context, intensity, and duration of emitter site use, the Air Force has not identified any adverse impacts to infrastructure associated with the Proposed Action. Therefore, this issue area is not carried forward for site-specific analysis in Chapter 4.

### 3.13.3 General Training Activity Impact Assessment

Based on the scope of action described in Chapter 2, all training activities except for establishment of LZs/DZs, UoEX, LLHI/Es, AO, Natural Resource Consumption, and OHO would have at least some interaction with utility or transportation resources.

Use of utilities would only occur at BRSF associated with use of the hardened camp sites. Use at these locations would be intermittent, and would not be expected to result in any additional burden on utility providers because these sites have been used in the past more frequently with no issues. With regards to transportation resources, small convoys (5–10 vehicles) may be used to transport troops to/from the training sites; this would not be expected to result in any transportation issues. There would be occasional, temporary closures of specific roadways during BD. These closures would be road-segment specific, at night, and only during training operations. These closures would not result in restricted access to forest areas because there are multiple roadways available on each forest to allow “drive-arounds.” As part of general operating constraints, boating activity associated with AO would require avoidance of recreational boaters. Based on the above the Air Force does not anticipate adverse impacts associated with transportation or infrastructure. Consequently, this issue area has not been carried forward for detailed analysis in Chapters 5 (BRSF) and 6 (THSF).

#### 3.13.3.1 General Training Activity Impact Assessment Summary

Table 3-57 identifies potential interactions between Proposed Action effectors and infrastructure receptors; no potential for adverse impacts have been identified. Activities shaded in green have little potential to impact public health or safety or the human and natural environment or do not result in potential violations of federal, state, or local regulations. Therefore, these activities are not carried forward for detailed analysis in Chapters 5 and 6.

**Table 3-57. Receptor and Effector Interactions for Infrastructure**

Effector	Infrastructure Resource Area Potentially Affected (Receptor)	
	Utilities	Transportation
Land Disturbance		
Land development	These issues have not been carried forward for site-specific analysis. <b>Proposed Action:</b> There are no land disturbance activities proposed that would interact with these resources. <b>Subalternative 1:</b> Same as the Proposed Action.	
Point impacts		
Incidental surface disturbance		

**Table 3-57. Receptor and Effector Interactions for Infrastructure, Cont'd**

Effector	Infrastructure Resource Area Potentially Affected (Receptor)	
	Utilities	Transportation
Consumption		
Ground Movement		
Wheeled vehicles	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with utilities. <b>Subalternative 1:</b> Same as the Proposed Action.	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified. Intermittent movement of small convoys along federal, state, and local roadways would not impact roadway traffic. Temporary closure of affected roads for Blackout Driving would be infrequent, would only occur at night, and would have a negligible impact on use of forest roads. <b>Subalternative 1:</b> Impacts would generally be the same as described under the Proposed action, with decreased potential for impact associated reduced scope of proposed activities (e.g., no Blackout Driving).
Dismounted maneuver	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with utilities or transportation resources. <b>Subalternative 1:</b> Same as the Proposed Action.	
Use of Expendables		
Blanks/GBS	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with utilities or transportation resources. <b>Subalternative 1:</b> Same as the Proposed Action.	
Smoke grenades		
Other/equipment		
Aircraft Operations	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with utilities or transportation resources. <b>Subalternative 1:</b> Same as the Proposed Action.	
Amphibious Operations	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with utilities or transportation resources. <b>Subalternative 1:</b> Same as the Proposed Action.	
Utilities	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No adverse impacts have been identified. Utilities (electricity, potable water) at the BRSF STOP Camp and Santa Rosa Youth Academy site would be used to support the Hardened Camp Site Use activity. Use at these locations would be intermittent, and would not be expected to result in any additional burden on utility providers because these sites have been used in the past more frequently with no issues. No interaction with utilities at THSF. <b>Subalternative 1:</b> Same as the Proposed Action.	This issue has not been carried forward for site-specific analysis. <b>Proposed Action:</b> No interaction with transportation. <b>Subalternative 1:</b> Same as Proposed Action.

BSRF = Blackwater River State Forest; GBS = ground-burst simulator; STOP = Short-Term Offender Program; THSF = Tate's Hell State Forest

### 3.13.4 Proposed Resource-Specific Mitigations

Based on general impact analyses presented in Section 3.13, no Resource-Specific Mitigations have been identified for infrastructure and transportation. Implementation of General Operational Constraints described in Section 2.5 would serve to minimize the potential for any adverse impacts.

### 3.14 PROPOSED ACTION AFFECTED RESOURCE SUMMARY

[Table 3-58](#) provides a summary of resources potentially adversely affected by the Proposed Action, based on analyses provided in Sections [3.2–3.13](#). A “dot” indicates an interaction between a resource and an effector. Resource areas and interactive effectors identified in yellow show the potential for adverse impacts to site-specific resources and have been carried forward for site-specific analyses in Chapters [4](#), [5](#), and [6](#) to determine the associated level of impact.

Resource areas and interactive effectors identified in green have not been carried forward for site-specific analysis in Chapters [4](#), [5](#), and/or [6](#) because (1) there is no potential interaction between the Proposed Action and the resource/issue area, (2) general analyses provided in Sections [3.2–3.13](#) have determined that there is no potential for violation of federal, state, or local regulation and that any impacts to public health and safety and the human and natural environment are either neutral or have no adverse effect despite the site-specific nature of the resource, or (3) incorporation of identified General Operational Constraints (Section [2.5](#)) and/or Proposed Resource-Specific Mitigations (indicated in respective resource-area discussions) as part of the Proposed Action precludes adverse impacts.

**Table 3-58. Proposed Action Affected Resource Summary**

Effector	Potentially Adversely Affected Resources											
	Airspace ( <a href="#">3.2</a> )	Noise ( <a href="#">3.3</a> )	Safety ( <a href="#">3.4</a> )	Air Quality ( <a href="#">3.5</a> )	Earth Resources ( <a href="#">3.6</a> )	Water Resources ( <a href="#">3.7</a> )	Biological Resources ( <a href="#">3.8</a> )	Cultural Resources ( <a href="#">3.9</a> )	Land Use ( <a href="#">3.10</a> )	Socioeconomics/ Environmental Justice ( <a href="#">3.11</a> )	Haz/Solid Materials & Waste ( <a href="#">3.12</a> )	Infrastructure ( <a href="#">3.13</a> )
Land Disturbance												
Land development					•			•				
Point impact					•	•	•	•				
Incidental surface disturbance					•	•	•	•				
Consumption						•	•					
Ground Movement												
Wheeled vehicles		•	•	•	•	•	•	•	•	•	•	•
Dismounted movement					•	•	•	•	•	•	•	
Use of Expendables/Equipment												
Blanks/GBS		•	•	•	•	•	•		•	•	•	
Smoke grenades			•	•	•	•	•		•	•	•	
Other/equipment		•	•	•	•	•	•		•	•	•	
Aircraft Operations	•	•	•	•	•		•	•	•	•	•	
Amphibious Operations		•	•	•	•	•	•	•	•	•	•	
Electromagnetic Radiation			•				•		•	•		
Utilities												•

GBS = ground burst simulator



### 3.14.1 Proposed Resource-Specific Mitigations

Based on the scope of activities associated with the Proposed Action, the inherent General Operational Constraints identified in Section 2.5, and related impact analyses detailed in Chapter 3, there are no identified Resource-Specific Mitigation impact minimization procedures necessary for the following resource areas: solid/hazardous materials and waste, and infrastructure and transportation.

Impact analysis of the Proposed Action has identified the following Proposed Resource-Specific Mitigations that would be implemented, in addition to General Operational Constraints in Section 2.5, to further minimize or avoid adverse impacts – in most cases impacts would be minimized such that impact level categories would be reduced from “adverse” (yellow) to “neutral” or “no effect” (green).

#### Both Forests

##### *Airspace Management*

A coordination process would be established by which the Air Force would work with FFS POCs prior to any mission to ensure that FFS operations and recreational aviation activities would not be negatively impacted by GLI training.

##### *Noise*

- Aircraft would not operate below 500 feet AGL except while engaged in approaches to, departures from, or training at designated LZ/DZ locations.
- LZ/DZs would be sited at not less than 2,200 feet from known noise-sensitive locations. Known noise-sensitive locations include campgrounds, hiking/horseback riding trails, stables, and privately owned parcels with at least one residential structure.
- Maneuvers near the LZ/DZ (i.e., initial approach, departure, circling and pattern work at less than 500 feet AGL) would not be conducted at distances less than 200 feet from known noise-sensitive locations.
- OHO locations would not be located within 2,200 feet of known noise-sensitive locations.

##### *Earth Resources*

- Utilize sites that are best suited to the intended activity and avoid areas with known constraints or limitations.
- Temporally and spatially disperse LZ/DZ training to minimize repetitive use impacts to landing zone surface conditions and maximize life cycles. Utilize mission logistics information to plan training events that avoid, to the degree possible, LZ/DZ areas used during the previous two years. A rest period would promote vegetative growth and allow disturbed areas to recover.
- Inspect LZs/DZs following each training mission. Coordinate immediate repairs of damaged areas with the GLI Liaison.

- Avoid LZ/DZ areas with highly and potentially highly erodible soils and hydric soils. Soil erosion potentials increase with increasing soil erodibility and wet soil are highly sensitive to damage by compaction and rutting.
- Maintain at least a 100 foot exclusion buffer around sensitive steephead slopes and closed depression subsidence areas to prevent accelerated soil erosion of slopes and wet soil rutting.
- As necessary, install temporary metal landing mats for LZ/DZ landing training activities conducted in wet areas during poor weather conditions. Mats can reduce potentials for soil damage and provide stable platforms aircraft landings, materials and personnel loading and unloading, and temporary storage.
- To the degree possible, utilize established walking trails or designated roads during cross county dismounted maneuvers.
- Avoid cross county maneuvers through steephead locations. The steep to very steep slopes of these geologic features are highly prone to accelerated rates of erosion if disturbed.
- Avoid the use of borrow pits for temporary campsites. For some pits, additional surface disturbances could increase soil erosion rates or affect the stability of early-stage pit reclamation.
- Avoid establishing temporary camps within or in proximity to steepheads and closed depression areas. These sites may be sensitive to increases in stormwater runoff of disturbances associated with camp activities. An exclusion zone of at least 100 feet is recommended.
- Avoid sensitive streambank areas that are overheightened and oversteepened and/or areas exhibiting bank scour and mass failure features.
- To the degree possible, avoid the repetitive use of the same egress and ingress locations within the same year for AO.
- For sites where vegetation damage could result in loss of plant cover, reseed with native species to encourage the reestablishment of vegetative cover.

### **Water Resources**

- Use only FFS-approved, designated vehicle water crossings in “Good” or “Fair” condition. Report any damaged water crossings identified in the field to the GLI Liaison.
- If off-road vehicle use is required for any reason the respective FFS Management Office would need to be consulted prior to occurrence, and no vehicles would be allowed within 100 feet of a surface water body or wetland as specified by EABFI 13-212.
- To minimize localized damage potential from foraging and dismounted troop movements, the size of troop units will be kept to small manageable numbers. Troop use would be rotated within and among TAs to prevent concentration of activities in particular locations. Implementation of this mitigation would allow water resources to recover from extended use after intensive training activities.

- Roads, trails, and stream/wetland crossings would be inspected before and after each training mission to identify maintenance issues that could cause problems if not repaired. Training activities would be shifted or redirected if conditions of roads and stream and wetland crossings require repair or other measures to prevent erosion from impacting surface waters and wetlands. The FFS will be notified of any identified issues. Wheeled vehicle training would only occur on crossings rated as good or fair condition; no wheeled vehicle training would occur at crossings rated Poor until these crossing are approved by the FFS.
- AO would utilize designated ingress/egress locations as determined by the GLI Liaison and the FFS. To the extent possible AO should use established, hardened boat ramps for ingress/egress of amphibious craft. If ingress/egress must utilize natural habitat in wetlands, care should be taken to prevent destruction of wetland vegetation or other activities that might cause shoreline erosion. Ingress/egress points for both personnel and watercraft should be rotated to the extent possible to allow sites time to recover from AO.

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## 4. EMITTER SITES AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

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### 4.1 INTRODUCTION

This chapter provides the affected environment and environmental impact analysis for use of emitter sites as described in Section [2.3.1](#). As discussed in Chapter [3](#), Section [3.14](#), *Proposed Action Affected Resource Summary*, some resource areas would experience no interaction with this activity, or general impact analyses in Sections [3.2](#) through [3.13](#) have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. This is noted in each applicable resource area's section. Overall, impact analyses for EMR account for any applicable General Operational Constraints identified in Section [2.5](#). At the end of this chapter, Section [4.14](#) summarizes the emitter site environmental analysis and any associated Proposed Resource-Specific Mitigations required to minimize or avoid adverse impacts.

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### 4.2 AIRSPACE MANAGEMENT AND USE

As discussed in Chapter [3](#) (Section [3.2.2](#)), emitter site use would not be expected to result in impacts to airspace management. As a result, this resource area is not discussed in further detail in this chapter.

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### 4.3 NOISE

#### ***Proposed Action and Subalternative 1 (Preferred Alternative)***

As discussed in Chapter [3](#) (Section [3.2.2](#)), emitter site use under the Proposed Action or Subalternative 1 would not be expected to result in adverse noise impacts associated with public health and safety or the human and natural environment. Construction noise impacts associated with fencing installation and potential tree maintenance would be temporary and localized. Under the Proposed Action, operations of a generator at emitter site FWC-2 would result in noise levels of approximately 49 dB at the nearest residence. These operations would be in compliance with all federal, state, and local regulations.

Under Subalternative 1, FWC-2 (and FWC-1) would not be used. Under this alternative, generators would not be required at any of the proposed emitter sites.



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## 4.4 SAFETY

### 4.4.1 Affected Environment

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

The affected environment for safety as it relates to proposed activities comprises the policies and procedures currently in place at Eglin AFB, previously discussed in Sections [3.4.2](#) and [3.4.3](#).

Because of the strict review and control of activities employing the use of EMR emitters, there is little, if any, EMR exposure to personnel that might cause injury to or that may result in explosion or fire hazards.

The Blackwater Forestry Center (BFC) and the Tallahassee Forestry Center (TFC) of the FFS have primary responsibility for BRSF and THSF, respectively. TFC and BFC are responsible for prevention, detection, and suppression of wildfires, as well as responding to emergencies, such as accidents. BFC encompasses Escambia, Santa Rosa, and Okaloosa Counties, while TFC encompasses Leon, Gadsden, Liberty, Wakulla, Jefferson, and Franklin Counties. Both BFC and TFC have cooperative agreements with local fire and police departments, and also call on the Florida Highway Patrol and Florida Department of Transportation to provide assistance as needed. For more information on the capabilities of BFC and TFC, please refer to Sections [5.4](#) and [6.4](#), respectively.

### 4.4.2 Environmental Consequences

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

Because of the strict review and control of activities employing the use of EMR emitters on the Eglin Reservation, there is little, if any, EMR exposure to military personnel engaged in test range activities. There is also little chance of fuel vapor situations/EEDs that might cause injury to personnel if ignited or detonated by exposure to sufficient EMR field strengths.

Emitter site use would not be expected to result in significant adverse safety impacts to the public. Only the JTE system could emit EMR. This system has an SHD of 400 feet from habitable buildings or recreational sites and 268.7 feet from EED storage and 198.3 feet from fuel storage areas. [Table 4-1](#) lists the potential acceptable JTE emitter sites based on the SHD of 400 feet, which would result in no safety impacts to the population. All sites would be acceptable for radar and telemetry units.

**Table 4-1. Potential Locations for JTE Systems Based on SHD**

Emitter Site	Owner	Structures Within 400-foot Buffer <sup>1</sup>	Description of Land <sup>2</sup>	Acceptable Location for the JTE System
EAFB-1	Eglin	Structures exist; not residential	Barren land	Potential
FFS-1	FFS	Yes	Low-density residential	No
FFS-2	FFS	Yes	Low-density residential	No
FFS-3	FFS	Potential	Medium-density residential	No
FFS-4	FFS	Yes	Low-density residential	No
FFS-5	FFS	Structures exist; not residential	Education/institutional	Potential
FFS-6	FFS	Structures exist; not residential	Education/institutional	Potential
FFS-7	FFS	Structures exist; not residential	Commercial services	Potential
FFS-8	FFS	None	Low-density residential	Yes
FFS-9	FFS	None	Wetland forest mix	Yes
FWC-1 <sup>3</sup>	FWC	None	Upland forest	Yes
FWC-2 <sup>3</sup>	FWC	None	Upland forest	Yes
FWC-3 <sup>3</sup>	FWC	None	Upland forest	Yes

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission; JTE = joint threat emitter; SHD = safety hazard distance

1. Based on evaluation of satellite imagery

2. FDEP, 2007a

3. Under Subalternative 1 sites FWC-1 and FWC-2 would not be used, site FWC-3 would be used under Subalternative 1 only.

Additional guidance on protecting personnel from electromagnetic fields, including safety training and personal protection equipment, is provided in Defense Instruction 6055.11, *Protection Personnel from Electromagnetic Fields* (DoD, 2009). Since radars would be placed to avoid populated areas, and the sites would be fenced or have other security measures to prevent unauthorized personnel from entering the safety hazard area, no significant impacts to the general public would be expected. Air Force personnel, both military and civilian, working directly with the JTE equipment would adhere to the safety guidelines provided in the 2008 SSHA and Defense Instruction 6055.11. Therefore, no significant impacts to military personnel would be expected under the Proposed Action.

Based on [Table 4-1](#), the JTE system would not be located at the following emitter sites due to the proximity of residential structures within the SHD: FFS-1, FFS-2, FFS-3 and FFS-4. As a result, there would be no adverse impacts associated with emitter use at these locations.

Sites EAFB-1, FFS-5, FFS-6, and FFS-7 currently have structures within or near proposed SHDs; however, these structures are not residential. These sites would need to be evaluated prior to JTE use to ensure no persons are within these structures that may be at risk of EMR exposure. Provided this mitigation is implemented, the potential for adverse impacts would be avoided.

### 4.4.3 Impact Summary

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

[Table 3-16](#) identifies the context, intensity, and duration factors utilized in safety analysis; based on these factors the Air Force has identified the potential for insignificant adverse impacts to public health and safety at four proposed emitter sites associated with the JTE SHD and proximity to inhabited buildings. This impact can be mitigated through actions described in Section [4.4.4](#). [Table 4-2](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 4-2. Proposed Action/Subalternative 1 Impacts Summary for Safety – Emitters**

Receptor	Emitter Site												
	EAFB-1	FFS-1 <sup>a</sup>	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1 <sup>c</sup>	FWC-2 <sup>c</sup>	FWC-3 <sup>c</sup>
Population	b					b	b	b					

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission

a. Assumes no joint threat emitter locations.

b. Adverse impacts can be mitigated as described in Section [4.4.4](#).

c. Under Subalternative 1 sites FWC-1 and FWC-2 would not be used, site FWC-3 would be used under Subalternative 1 only.

### 4.4.4 Proposed Resource-Specific Mitigations

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

Implementation of the following mitigations would preclude any adverse impacts, reducing impact significance as listed in [Table 4-2](#) from adverse (yellow) to neutral or no effect (green).

- Sites EAFB-1, FFS-5, FFS-6, and FFS-7, where structures currently exist within the proposed SHD but are not residential, would be verified as vacant before allowing the JTE system to be utilized at these emitter locations. If not vacant, the JTE would not be utilized at these locations.
- The proximity to populated areas would continue to be monitored to determine constraints associated with the site and respective operational parameters of the specific system.

## 4.5 AIR QUALITY

### 4.5.1 Affected Environment

Emitter sites would be located in various locations across the northwest Florida panhandle. To adequately capture emissions over such a broad area and to accommodate the changing emitter site locations the Mobile-Pensacola-Panama City-

Southern Mississippi Interstate AQCR is used as the ROI. This AQCR includes 50 counties from Alabama, Florida, and southern Mississippi. The baseline emissions from counties within the AQCR are shown in [Table 4-3](#). Emitter locations would all be within Florida, and all counties in the Florida panhandle are in attainment for all criteria pollutants.

**Table 4-3. Mobile-Pensacola-Panama City-Southern Mississippi Interstate AQCR Emissions**

County	Pollutant (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Mobile-Pensacola-Panama City-Southern Mississippi AQCR	1,186,153	239,817	941,076	166,962	112,770	1,543,314	39,001,288

Source: USEPA, 2014a

AQCR = Air Quality Control Region; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

## 4.5.2 Environmental Consequences

### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Emitter sites would involve the use of generators at sites where power utilities are not available. Mobile emitters would require vehicle transportation to the location, which would cause some air pollutant emissions. Although Subalternative 1 would utilize one fewer emitter sites, the analysis estimated that up to five sites would be operating simultaneously in either case. Emissions of air pollutants from emitter sites would be negligible compared with the AQCR ([Table 4-4](#)).

**Table 4-4. Air Pollutant Emissions for Emitter Sites**

Emitter Emissions	Emissions <sup>1</sup> (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Estimated average/event	0.28	0.00	0.01	0.01	0.00	0.06	1.01
Maximum emissions/year	0.78	1.57	0.15	0.15	0.10	0.21	140.58
AQCR	1,186,153	239,817	941,076	166,962	112,770	1,543,314	39,001,288
Percent of AQCR Emissions <sup>2</sup>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

AQCR = Air Quality Control Region; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

1. Emissions calculated assume that 5 emitter sites operate simultaneously per event and each generator operates for 6 hours per event.

2. Maximum emissions per year are compared with AQCR emissions.

## 4.5.3 Impact Summary

[Table 3-19](#) identifies the context, intensity, and duration factors utilized in air quality impact analysis; based on these factors, the Air Force has not identified adverse air

quality impacts to public health and safety or the human and natural environment associated with emitter sites. [Table 4-5](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 4-5. Proposed Action/Subalternative 1 Impacts Summary for Air Quality – Emitters**

Receptor	Emitter Sites – Proposed Action												
	EAFB-1	FFS-1a	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1*	FWC-2*	FWC-3*
Air Quality	No adverse impacts would occur. Emissions from emitter use are less than 0.001 percent of regional air emissions for both criteria pollutants and greenhouse gases.												N/A
Greenhouse Gases													
	Emitter Sites – Subalternative 1												
Air Quality	No adverse impacts would occur. Emissions from emitter use are less than 0.001 percent of regional air emissions for both criteria pollutants and greenhouse gases.										N/A	N/A	
Greenhouse Gases													

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission; N/A = not applicable

#### 4.5.4 Proposed Resource-Specific Mitigations

In the absence of any identified adverse air quality impacts, no Resource-Specific Mitigations for air quality have been identified.

## 4.6 EARTH RESOURCES

Based on the scope of action described in Chapter 2, and as identified in Chapter 3, emitter site use would not be expected to affect any earth resources because all sites are either “improved” or “semi-improved.” Most sites would require few, if any, minor improvements to support the emitters. Consequently, this resource area is not discussed further in this chapter.

## 4.7 WATER RESOURCES

Based on the scope of action described in Chapter 2, and as identified in Chapter 3, emitter site use would not be expected to affect any water resources because all sites are either “improved” or “semi-improved.” Most sites would require few, if any, minor improvements to support the emitters and no water resources would be affected. Consequently, this resource area is not discussed further in this chapter.



## 4.8 BIOLOGICAL RESOURCES

As discussed in Chapter 3, biological resources would not be affected by emitters, as these instruments would be operated on improved and semi-improved areas. As a result, this resource area is not discussed further in this chapter.

## 4.9 CULTURAL RESOURCES

As discussed in Chapter 3, emitter site use does not have the potential to impact cultural resources. Sites have been previously developed with adequate infrastructure in place. Therefore, this resource area is not discussed further in this chapter.

## 4.10 LAND USE

### 4.10.1 Affected Environment

The majority of the emitter sites are located on FFS land (FFS-1 through FFS-9); the remaining sites are located on FWC land (FWC-1, FWC-2, and FWC-3) and Eglin AFB (EAFB-1). See [Figure 2-5](#) through [Figure 2-7](#) for a regional and local view of emitter sites. All sites are currently listed as either “improved” or “semi-improved.”

General land use types associated with the proposed emitter sites include barren land, forested, urban/built up, and wetlands (FDEP, 2007b). [Table 4-6](#) lists the land uses in each emitter site. For the majority of the FFS sites, the dominant land use is urban/built up, while both FWC sites are forested and the Eglin AFB site is located in a parcel of barren land.

**Table 4-6. Land Use Type Associated with Emitter Sites**

Land Use Type	Emitter Location (Land Use Type Present at Emitter Site)												
	EAFB-1	FFS-1	FFS-2	FFS-3	FFS-4	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2	FWC-3
Barren land	•												•
Forested					•						•	•	
Urban/built up		•	•	•		•	•	•	•				
Wetlands										•			

Source: FDEP, 2007b

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission

### 4.10.2 Environmental Consequences

#### *Proposed Action*

Emitter site use would not be expected to result in significant adverse impacts to this resource, because no significant noise (Sections 3.3 and 4.3) or safety (Sections 3.4 and 4.4) impacts have been identified that would impact existing land use. Only those emitters that use a generator as a power source would increase the noise level;

however, the noise would be intermittent and would not result in adverse impacts (see Section [4.3](#), *Noise*).

Safety concerns associated with the emitter systems are further detailed in Section [4.4.2](#), *Safety, Environmental Consequences*. Only the JTE system has the potential to emit EMR and, therefore, must not be placed within 400 feet of habitable buildings or recreational sites, nor within 268.7 feet of EED storage or 198.3 feet from fuel (see Section [4.4.2](#)). [Table 4-1](#) located in Section [4.4.2](#) lists the potential acceptable JTE emitter sites based on the SHD of 400 feet, which would result in no impacts to the population. All sites would be acceptable for radar and telemetry units.

### ***Subalternative 1 (Preferred Alternative)***

Potential impacts under Subalternative 1 would be similar to those described for the Proposed Action. However, because of concerns raised by the FWC regarding land management activities at sites FWC-1 and FWC-2, FWC-3 was identified as an alternate site. If the subalternative were to be selected as a result of the Record of Decision, site FWC-3 would replace sites FWC-1 and FWC-2 and there would be no additional adverse impacts.

### **4.10.3 Impact Summary**

[Table 3-45](#) identifies the context, intensity, and duration factors utilized in land use analysis; based on these factors the Air Force has identified the potential for insignificant adverse impacts to public health and safety at two proposed emitter sites associated with the JTE SHD and proximity to inhabited buildings. This impact can be mitigated through actions described in Section [4.4.4](#). The Air Force has not identified any significant land use impacts associated with emitter sites. [Table 4-7](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 4-7. Proposed Action/Subalternative 1 Impacts Summary for Land Use – Emitters**

Receptor	Emitter Site												
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1*	FWC-2*	FWC-3*
Land Use	**					**	**	**					

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission

\* Under the Proposed Action FWC-3 would not be used; Subalternative 1 FWC-3 would replace FWC-1 and FWC-2

\*\* Adverse impacts can be mitigated as described in Section [4.4.4](#)

### **4.10.4 Proposed Resource-Specific Mitigations**

Proposed Resource-Specific Mitigations as described in Section [4.4.4](#) would offset any potential land use impacts and mitigate impacts from adverse (yellow) to beneficial or no effect (green) through avoidance of any land use conflicts.

## 4.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

### 4.11.1 Affected Environment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

The main concern for socioeconomics and environmental justice resource areas is the potential noise and safety hazards associated with the emitter sites that could potentially impact nearby populations and noise-sensitive receptors, such as schools and childcare centers.

The potential emitter sites are located across nine counties in northwest Florida. [Table 4-8](#) lists the total population of each county and the portion of minority, low-income, and youth populations out of the total county population in which the emitter sites are located. The closest population to the emitter sites is provided in [Table 2-1](#) in Chapter 2. There are no sensitive noise receptors (e.g., schools, childcare centers) within 1 mile of any of the emitter sites.

**Table 4-8. County Data for Emitter Site Locations**

Emitter Site ID	Location	Total Population	Minority (%)	Low-Income <sup>1</sup> (%)	Youth (%)
FFS-7, FFS-9	Bay	168,852	20.8%	14.7%	22.0%
FFS-8	Calhoun	14,625	22.3%	23.5%	21.4%
FFS-5	Escambia	297,619	33.8%	18.1%	21.6%
FWC-1, FWC-2, FWC-3, FFS-2	Franklin	11,549	20.4%	20.6%	17.1%
FFS-6	Gulf	15,863	25.1%	16.4%	16.2%
EAFB-1	Okaloosa	180,822	22.9%	13.4%	22.3%
FFS-1	Santa Rosa	151,372	15.0%	12.3%	23.9%
FFS-3	Walton	55,043	14.9%	17.9%	20.6%
FFS-4	Washington	24,896	21.5%	20.1%	21.2%
<b>Florida</b>		<b>18,801,310</b>	<b>42.1%</b>	<b>16.3%</b>	<b>21.3%</b>
<b>United States</b>		<b>308,745,538</b>	<b>36.3%</b>	<b>15.4%</b>	<b>24.0%</b>

Source: U.S. Census Bureau 2010, 2013a

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission; ID = identifier

1. American Community Survey, 5-year estimate, 2009–2013

### 4.11.2 Environmental Consequences

#### *Proposed Action*

No significant noise (Sections [3.3](#) and [4.3](#)), safety (Sections [3.4](#) and [4.4](#)), or land use (Sections [3.10](#) and [4.10](#)) impacts have been identified that would affect the surrounding populations. Thus, emitter site use would not be expected to result in significant adverse impacts to socioeconomic or disproportionate impacts to environmental justice resources. Use of emitters powered by a generator would increase the noise level; however, the noise would be intermittent and would not result in adverse impacts (see Section [4.3](#), Noise).

As discussed in Section [4.10.2](#), the JTE system would not be located at Sites FFS-1, FFS-2, FFS-3, and FFS-4, due to the proximity of residential structures within the SHD. As a result, no adverse impacts would be associated with emitter use at these locations.

Sites EAFB-1, FFS-5, FFS-6, and FFS-7 currently have structures within or near proposed SHDs, but these structures are not residential. However, to ensure no one is exposed to EMR, these sites would need to be evaluated prior to JTE use to ensure no persons are inside the structures. This mitigation would avoid the potential for adverse impacts.

All proposed emitter sites are located in counties with either a disproportionate percentage of low-income populations, youth populations, or both as compared with the state, or community of comparison (COC). However, the use of emitters would not result in disproportionate impacts to minority or low-income populations or pose a special risk to children, as long as appropriate mitigations are implemented. The mitigations detailed in Section [4.4.4](#) would prevent significant noise or safety impacts to populations, inhabited areas, or noise-sensitive locations (such as schools). Furthermore, those emitters powered by generators would create noise but only intermittently and at levels that would not harm individuals. Safety concerns would not significantly impact environmental justice areas, because emitter use would avoid impacts through SHD constraints analysis (see *Safety*, Section [4.4](#)). The JTE is the only emitter that has an SHD, and JTE use would be restricted to areas not encroaching on inhabited buildings, schools, and other populated areas. (See *Safety*, Section [4.4](#) for potential JTE locations that would not interfere with populations or pose a special risk to children).

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, sites FWC-1 and FWC-2 would be replaced by site FWC-3. Impacts under Subalternative 1 would be similar to those described under the Proposed Action – thus, no significant adverse impacts have been identified for Subalternative 1.

### **4.11.3 Impact Summary**

[Table 3-48](#) identifies the context, intensity, and duration factors utilized for socioeconomic and environmental justice impact analysis; based on these factors the Air Force has identified the potential for insignificant adverse impacts to public health and safety at four proposed emitter sites associated with the JTE SHD and proximity to inhabited buildings. This impact can be mitigated through actions described in Section [4.4.4](#). The Air Force has not identified any significant socioeconomic/environmental justice impacts associated with emitter sites.

[Table 4-9](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 4-9. Proposed Action/Subalternative 1 Impacts Summary for Socioeconomics/Environmental Justice – Emitters**

Receptor	Emitter Site-Proposed Action												
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2	FWC-3
Socioeconomics Resources	**					**	**	**					N/A
EJ/special risks to children	**					**	**	**					N/A
Receptor	Emitter Site – Subalternative 1												
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8	FFS-9	FWC-1	FWC-2	FWC-3
Socioeconomics Resources	**					**	**	**			N/A	N/A	
EJ/special risks to children	**					**	**	**			N/A	N/A	

EAFB = Eglin Air Force Base; EJ = Environmental Justice; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission; N/A – Under the Proposed Action FWC-3 would not be used; Subalternative 1 FWC-3 would replace FWC-1 and FWC-2

\* This assumes no joint threat emitter (JTE) locations

\*\* Adverse impacts can be mitigated as described in Section [4.4.4](#)

#### 4.11.4 Proposed Resource-Specific Mitigations

Proposed Resource-Specific Mitigations as described in Section [4.4.4](#) would offset any potential safety and land use impacts and mitigate impacts from adverse (yellow) to beneficial or no effect (green) through avoidance of any safety and land use conflicts that may directly or indirectly impact socioeconomics resources and/or environmental justice areas of concern.

#### 4.12 SOLID AND HAZARDOUS MATERIALS/WASTE

As discussed in Chapter [3](#), no impacts associated with solid and hazardous materials/waste resulting from emitter use have been identified. As a result, this resource area is not discussed further in this chapter.

#### 4.13 INFRASTRUCTURE AND TRANSPORTATION

As identified in Chapter [3](#) (Section [3.13.2](#)), emitter site use would not be expected to result in adverse impacts to utilities or transportation resources. As a result, this resource area has not been carried forward for detailed analysis.

#### 4.14 EMITTER SITES IMPACT SUMMARY

Overall, there is little interaction between emitter site use and environmental and anthropogenic resources. All sites are either improved or semi-improved and negligible improvements, such as installation of fencing or small areas of tree topping/clearing (approximately 0.6 acres at two or three sites), would not result in adverse impacts. Issues associated with safety, land use, and related socioeconomics and environmental justice resulting from emitter SHDs can be resolved by restricting use of the JTE at certain locations.



[Table 4-10](#) summarizes the impacts identified with emitter site use, by site, for potentially affected resources based on analyses presented in Chapter 3, Sections [3.2](#) through [3.13](#), and Chapter 4, Sections [4.2](#) through [4.13](#). Impacts are categorized as follows:

- Adverse (yellow) – Impacts to public health and safety, the human or natural environment or potential violation of federal, state, or local regulations
- Neutral / No Effect (green)

No significant adverse impacts have been identified. Resource-Specific Mitigations (in Section [4.14.1](#)) would serve to minimize or avoid any identified adverse impacts.

**Table 4-10. Proposed Action/Subalternative 1 Emitter Sites Impacts Summary**

Affected Resource	Emitter Site												
	EAFB-1	FFS-1*	FFS-2*	FFS-3*	FFS-4*	FFS-5	FFS-6	FFS-7	FFS-8*	FFS-9*	FWC-1*	FWC-2*	FWC-3**
Airspace (Section <a href="#">3.2/4.2</a> )													
Noise (Section <a href="#">3.3/4.3</a> )													
Safety (Section <a href="#">3.4/4.4</a> )	***					***	***	***					
Air Quality (Section <a href="#">3.5/4.5</a> )													
Earth Resources (Section <a href="#">3.6/4.6</a> )													
Water Resources (Section <a href="#">3.7/4.7</a> )													
Biological Resources (Section <a href="#">3.8/4.8</a> )													
Cultural Resources (Section <a href="#">3.9/4.9</a> )													
Land Use (Section <a href="#">3.10/4.10</a> )	***					***	***	***					
Socio/EJ (Section <a href="#">3.11/4.11</a> )	***					***	***	***					
Haz/Solid Materials & Waste (Section <a href="#">3.12/4.12</a> )													
Infrastructure (Section <a href="#">3.13/4.13</a> )													

EAFB = Eglin Air Force Base; FFS = Florida Forest Service; FWC = Florida Fish and Wildlife Conservation Commission

\* This assumes no joint threat emitter (JTE) locations

\*\* Under Subalternative 1 this emitter site would replace FWC-1 and FWC-2 (these sites would not be used)

\*\*\* Adverse impacts can be mitigated as described in Section [4.14.1](#)

#### 4.14.1 Proposed Resource-Specific Mitigations

The following Proposed Resource-Specific Mitigations have been identified for emitter site use and would result in impacts from adverse (yellow) to neutral/no effect (green).

**Safety/Land Use/Socioeconomics & Environmental Justice**

- Sites EAFB-1, FFS-5, FFS-6, and FFS-7, where structures currently exist within the proposed SHD but are not residential, would be verified as vacant before allowing the JTE system to be utilized at these emitter locations. If not vacant, the JTE would not be utilized at these locations.
- Continue to monitor the proximity to populated areas to determine constraints associated with the site and respective operational parameters of the specific system.

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## 5. BLACKWATER RIVER STATE FOREST AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

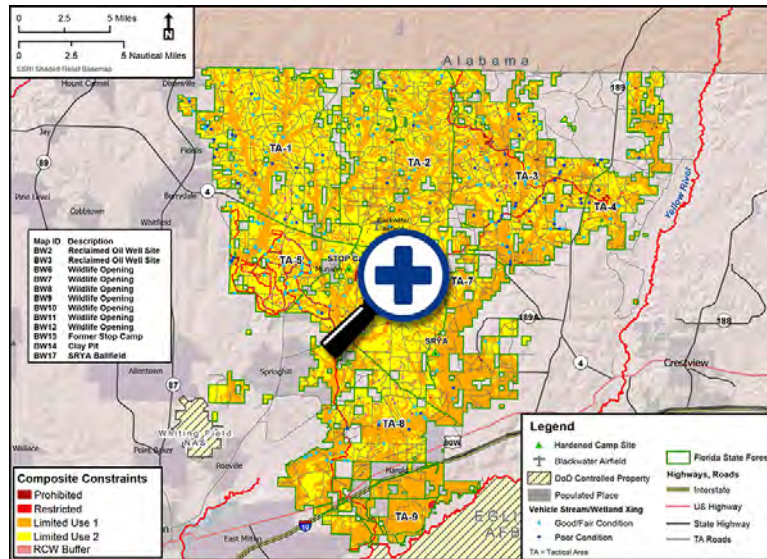
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### 5.1 INTRODUCTION

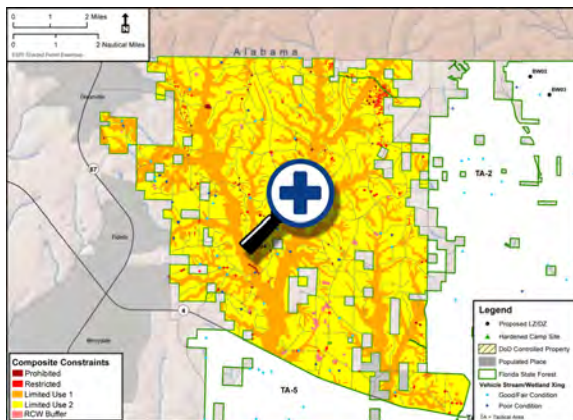
This chapter addresses the receptors identified in Chapter [3](#) (Affected Environment) specific to BRSF and the impacts (Environmental Consequences) on those receptors by the various effectors associated with the Proposed Action and Subalternative 1. As discussed in Chapter [3](#), Section [3.14](#) some resource areas would experience no interaction with this activity, or general impact analyses in Sections [3.2](#) through [3.13](#) have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. Additionally, in some cases the general analyses provided in Chapter [3](#) are sufficient to determine the extent of impacts on site-specific resources in that the general analysis is applied to the site-specific resources identified as the affected environment.

As noted in previous chapters, analyses rely heavily on previous NEPA documentation for similar activities within similar environments; these documents are incorporated by reference in certain sections where applicable, and are noted. Finally, the affected environment discussions provide information regarding the types of resources present; however, to avoid encyclopedic repetition of publicly available information the reader is directed to locations outside this document for such information should the reader desire it. As an example, the fact that sensitive species are present on BRSF is addressed and types, quantities and locations (where applicable and allowed by law) are described. However, as discussion of each individual species in terms of physical description and foraging/reproductive aspects are encyclopedic and readily available from various sources, the reader is directed to a location (e.g., the USFWS or Florida Natural Areas Inventory [FNAI] website) for this information. This is in keeping with 40 CFR requirements.

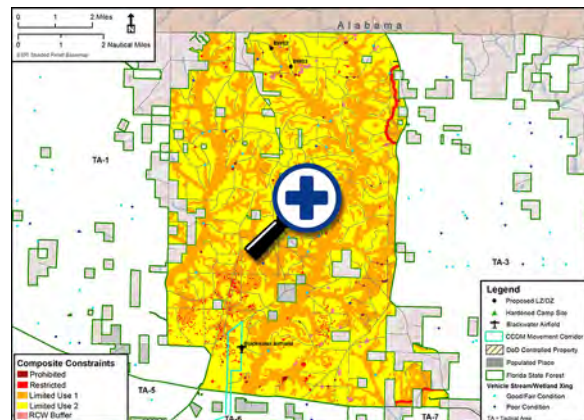
Training activity impact analyses consider the General Operational Constraints provided in Section [2.5](#). These are based on the establishment of the Protection Levels identified in [Table 2-21](#) as well as the noise protection levels resulting from impact analysis in Section [3.3](#), and presented in [Table 2-22](#). The following [Figure 5-1](#) through [Figure 5-10](#) provide graphical representation of the protection levels for ground operations at BRSF as a whole, and for each individual tactical area. [Figure 5-11](#) through [Figure 5-20](#) provide similar information for noise-generating activities at BRSF. Each map is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.



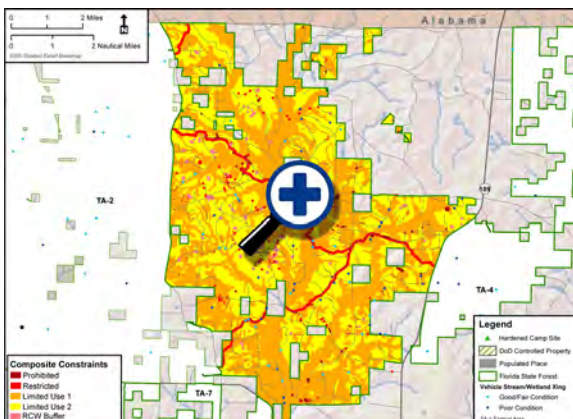
**Figure 5-1. BRSF Ground Operations Protection Levels**



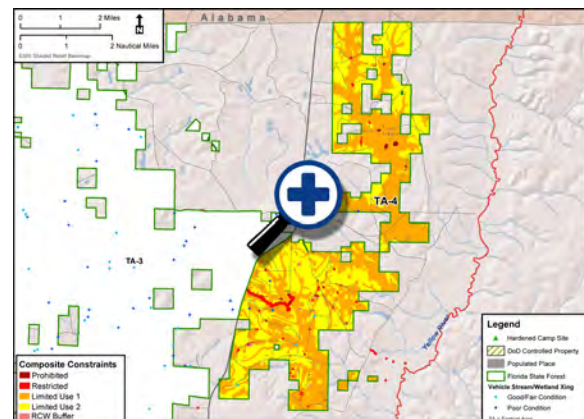
**Figure 5-2. BRSF TA-1 Ground Operations Protection Levels**



**Figure 5-3. BRSF TA-2 Ground Operations Protection Levels**

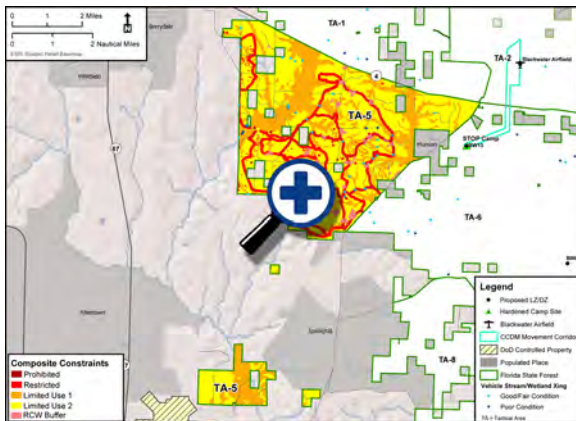


**Figure 5-4. BRSF TA-3 Ground Operations Protection Levels**

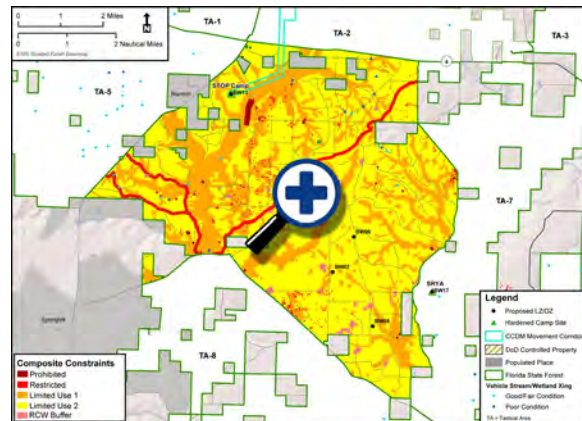


**Figure 5-5. BRSF TA-4 Ground Operations Protection Levels**

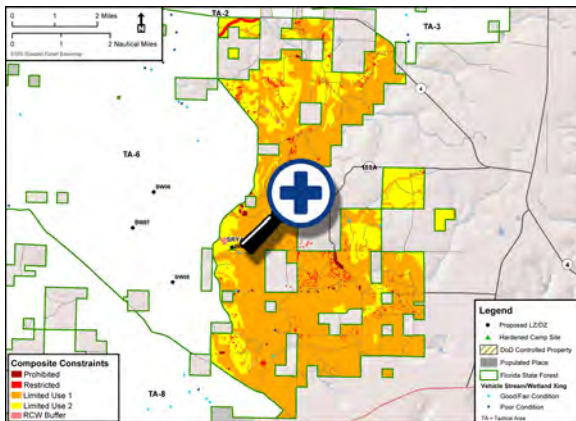




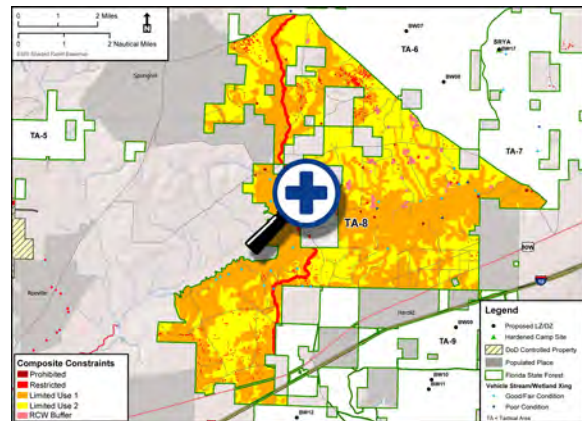
**Figure 5-6. BRSF TA-5 Ground Operations Protection Levels**



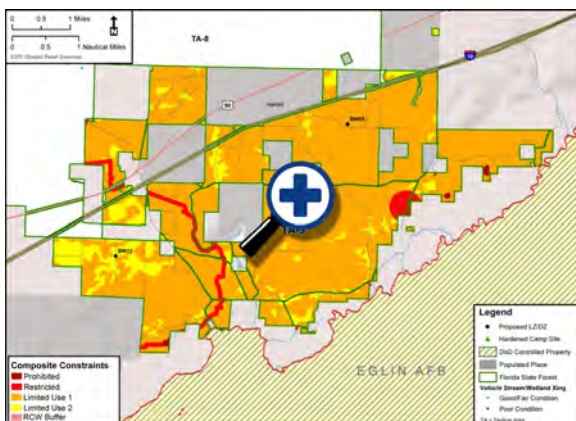
**Figure 5-7. BRSF TA-6 Ground Operations Protection Levels**



**Figure 5-8. BRSF TA-7 Ground Operations Protection Levels**



**Figure 5-9. BRSF TA-8 Ground Operations Protection Levels**



**Figure 5-10. BRSF TA-9 Ground Operations Protection Levels**

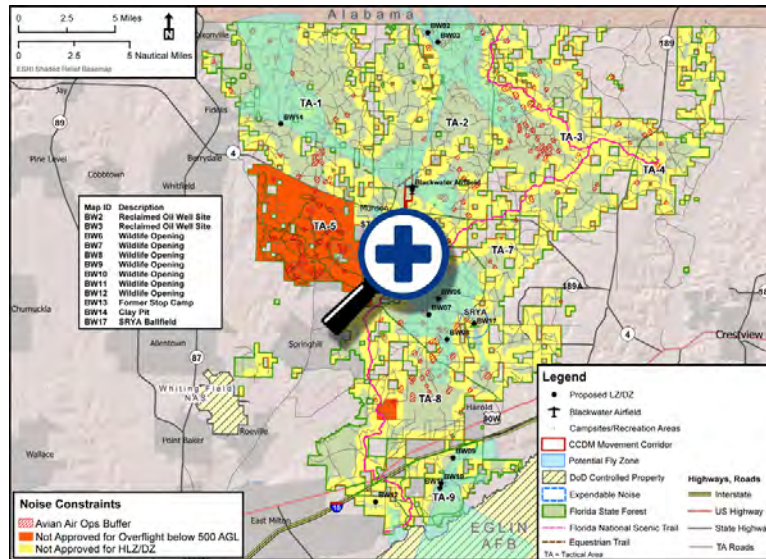


Figure 5-11. BRSF Noise Protection Levels

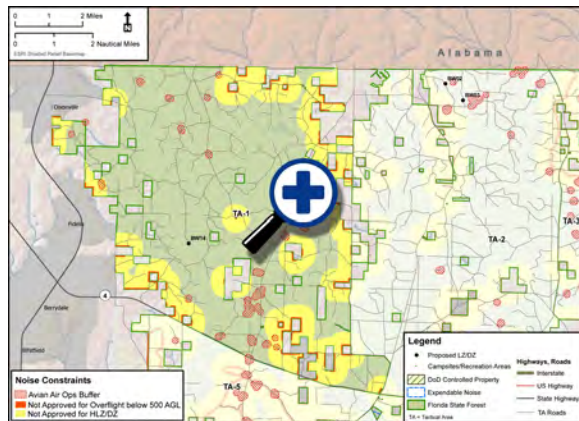


Figure 5-12. BRSF TA-1 Noise Protection Levels

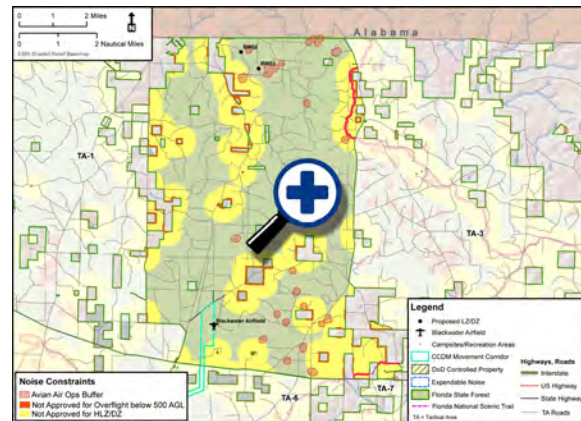


Figure 5-13. BRSF TA-2 Noise Protection Levels

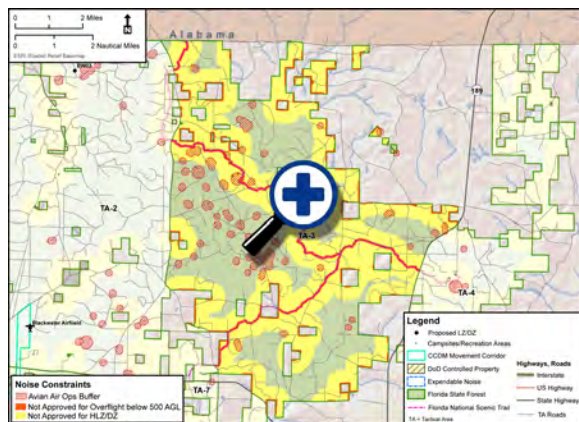


Figure 5-14. BRSF TA-3 Noise Protection Levels

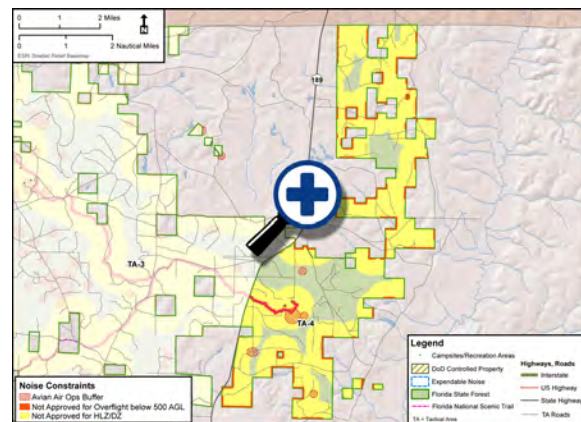
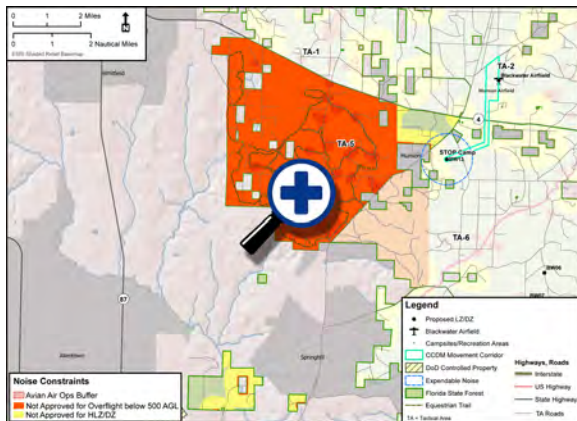
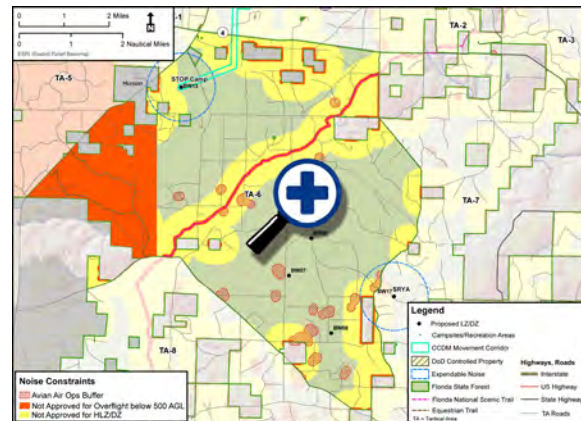


Figure 5-15. BRSF TA-4 Noise Protection Levels

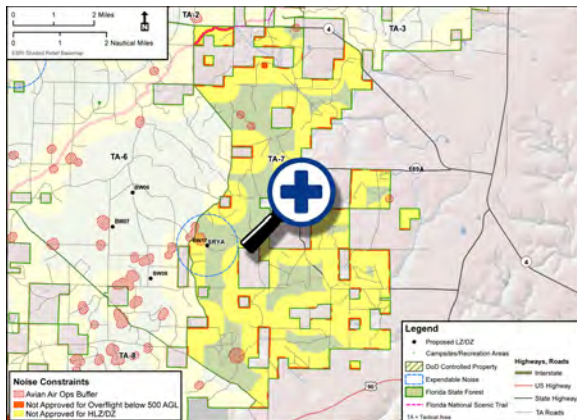




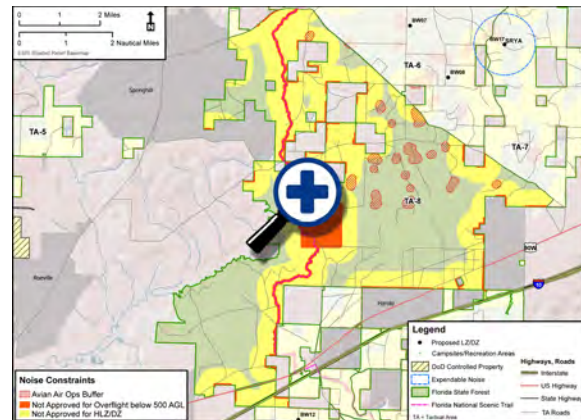
**Figure 5-16. BRSF TA-5 Noise Protection Levels**



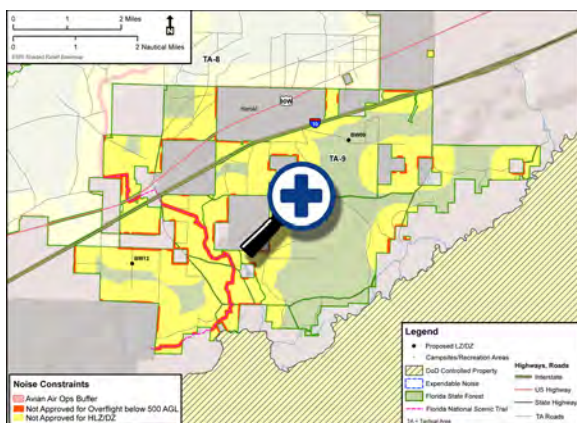
**Figure 5-17. BRSF TA-6 Noise Protection Levels**



**Figure 5-18. BRSF TA-7 Noise Protection Levels**



**Figure 5-19. BRSF TA-8 Noise Protection Levels**



**Figure 5-20. BRSF TA-9 Noise Protection Levels**

The surface area of BRSF covered by the various ground and noise protection levels per tactical area is provided in [Table 5-1](#).

**Table 5-1. BRSF Protection Level Coverage**

Protection Level*	Tactical Area									BRSF Total
	1	2	3	4	5	6	7	8	9	
Ground Operations Protection Levels										
Prohibited										
Acres	122	77	182	41	11	99	75	35	28	671
% of Area	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Restricted										
Acres	0	189	848	87	2,000	625	63	496	362	4,671
% of Area		<1	2.6	<1	12	3	<1	2	3	2
RCW (200-foot buffer)										
Acres	179	153	368	17	400	191	25	205	0	1,536
% of Area	<1	<1	<1	<1	2	<1	<1	<1		<1
LU-1										
Acres	11,800	14,743	18,129	6,280	4,515	7,537	12,145	12,199	10,382	97,628
% of Area	34	41	55	55	28	31	75	55	87	48
LU-2										
Acres	22,532	20,793	13,581	5,084	9,584	16,003	3,843	9,623	1,176	102,219
% of Area	65	58	41	44	60	66	24	43	10	50
Noise Protection Levels										
Not approved for aircraft overflights below 500 AGL										
Acres	628	829	1,763	666	13,506	3,885	722	1,047	645	23,690
% of Area	2	2	5	6	84	16	4	5	5	12
Not approved for LZs/DZs										
Acres	9,281	11,982	17,147	8,005	1,458	7,841	10,560	10,655	6,836	83,765
% of Area	27	34	52	70	9	32	65	48	57	41
Not approved for noise-generating expendables										
Acres	Not applicable – Noise-generating expendables would only be used at the STOP Camp and SRYA sites. The noise maps show the extent to which noise would extend beyond these locations from training activities (4,000 feet).									
% of Area										
Avian air operations buffer**										
Acres	701	676	1,611	160	1,248	671	182	702	0	5,950
% of Area	2	2	4	<1	8	3	<1	3		3

AGL = above ground level; BRSF = Blackwater River State Forest; DZ = drop zone; LU-1 = Limited Use 1; LU-2 = Limited Use 2; LZ = landing zone; RCW = red-cockaded woodpecker; STOP = Short-Term Offender Program; SRYA = Santa Rosa Youth Academy

\* Acreages and percentages are rounded to the nearest whole number unless value is less than 1%, in which case value is indicated as <1%.

\*\* Represented by red hatched areas on [Figure 5-11](#) through [Figure 5-20](#).

## 5.2 AIRSPACE MANAGEMENT AND USE

### 5.2.1 Affected Environment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Airspace in the region is heavily trafficked and supports a high level of military aviation. The airspace is carefully managed to provide for safe and efficient operations of both military and civilian aircraft. The same region would be affected under both the Proposed Action and Subalternative 1.

#### 5.2.1.1 Military Training Airspace

BRSF underlies several military training airspace units, as shown in [Figure 5-21](#). [Table 5-2](#) lists the characteristics of the airspace units and the approximate number of sorties flown in the airspace unit under baseline conditions.

**Table 5-2. Characteristics of Airspace Units Overlying BRSF**

Airspace	Airspace Type	Airspace Floor	Airspace Ceiling	Airspace Published Use Times	Managed By	Annual Sortie Operations
A-292	Alert area	Surface	3,000 feet within federal airways; FL 175 in other areas	Sunrise to 0100 Mon-Fri and sunrise to sunset Sat.	Training Wing Six, Pensacola NAS	Not scheduled
Pensacola North MOA	MOA	10,000 feet MSL	UTBNI 18,000 feet MSL	Sunrise to sunset, Mon-Sat, occasional use until 2400	Training Air Wing Five, Pensacola.	1,802 <sup>a</sup>
Eglin MOA A West	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	2,188 <sup>a</sup>
Eglin MOA A East	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	2,188 <sup>a</sup>
Eglin MOA B	MOA	1,000 feet AGL (200 feet AGL with NOTAM)	UTBNI 18,000 feet MSL	0600-2100 Mon-Fri	Air Armament Center, Eglin AFB	1,703 <sup>a</sup>
IR-021	MTR	5,000 feet MSL <sup>b</sup>	11,000 feet MSL <sup>c</sup>	1200-0400z Mon-Fri (occasional weekend use)	FACSFAC	26
IR-057	MTR	200 feet AGL <sup>b</sup>	3,000 feet MSL <sup>c</sup>	Continuous	1 SOG/OGO, Hurlburt Field	0 <sup>a</sup>
IR-059	MTR	200 foot AGL <sup>b</sup>	3,000 foot MSL <sup>c</sup>	Continuous	1 SOG/OGO, Hurlburt Field	0 <sup>a</sup>
R-2915A	Restricted area	Surface	Unlimited	Continuous	46th Operations Support Squadron, Eglin AFB	6,953 <sup>a</sup>

AGL = above ground level; FL = Flight Level; IR = instrument route; MOA = military operations area; MSL = mean sea level; MTR= military training route; NAS = Naval Air Station; NOTAM = notice to airmen; UTBNI = up to, but not including

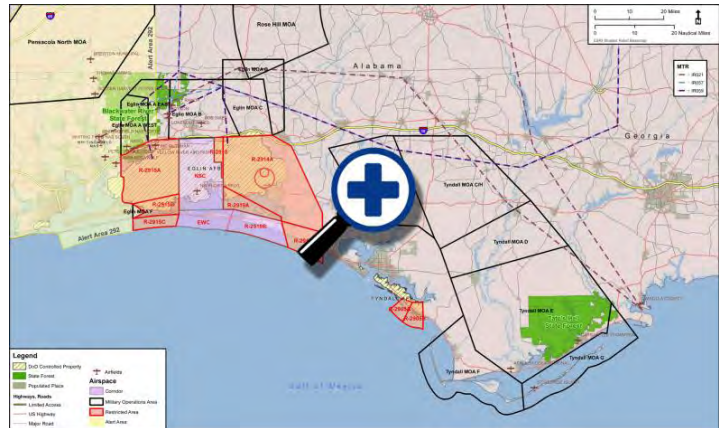
a. Calendar year 2010

b. Floor altitudes vary by segment. Lowest floor of MTR is listed in the table.

c. Ceiling altitudes vary by segment. Highest ceiling of MTR is listed in the table.



Alert Area 292 supports Navy training across a wide area at altitudes between ground elevation and 3,000 feet AGL (17,500 feet mean sea level [MSL] outside of federal airways). Alert areas are designated so that nonparticipating pilots will be aware of an increased number of flights in the area. The alert area is not scheduled, and Navy operations in the alert area do not preclude the operations of any other aircraft in the same area at the same time.



**Figure 5-21. Special Use Airspace Units and Airfields**

Pensacola North MOA is also managed by the Navy and used for training flights. The MOA has a floor altitude of 10,000 feet MSL.

Eglin A and B MOAs normally have floor altitude of 1,000 feet AGL, but this floor may be lowered to 200 feet AGL if a NOTAM is published. These MOAs overlie the central portion of BRSF and are used by about 2,200 sorties per year.

Three MTRs traverse BRSF. The floor altitudes of the three routes vary by segment. The lowest segment of IR-021 has floor altitude of 5,000 feet MSL, the lowest segment of IR-057 has a floor altitude at 200 feet AGL, and the lowest segment of IR-059 has a floor altitude of 200 feet AGL. These MTRs are used infrequently, on the order of about once every other week.

R-2915A supports a wide variety of test and training activities and is managed by Eglin AFB. The RA is heavily utilized by units conducting hazardous activities such as munitions training. Currently, the RA is also used for nonhazardous training events of the types that would occur at BRSF and THSF under the GLI.

#### **5.2.1.2 Airfields and Transiting Aircraft**

Jacksonville ARTCC is responsible for monitoring and controlling aircraft in the region while en route. ATC and RAPCON/TRACON facilities manage aircraft operating in their respective terminal areas.

[Table 5-3](#) lists airfields located at or near BRSF, along with the approximate number of airfield operations currently flown per year. Blackwater Airfield is located in central BRSF and supports FFS as well as provisional general aviation operations. The FFS conducts aircraft operations over BRSF as part of controlled burns, aerial surveys, and other operations. The frequency of these flights is variable from one season to the next depending on the number of prescribed burns conducted and other factors (Colburn, 2013). Brewton Municipal, Bob Sikes, Northwest Florida Regional, and Peter Prince Airports are civilian airfields, but each also supports military aircraft operations. Harold Naval outlying landing field (NOLF) Heliport, Santa Rosa outlying landing field (OLF), Whiting Field NAS North, Whiting Field NAS South are military airfields. Several

smaller airfields in the area are owned by private individuals or corporations, and the number of annual operations at these airfields is not reported.

**Table 5-3. Airfields In or Near BRSF**

Airfield Name <sup>a</sup>	Approximate Annual Airfield Operations
Blackwater/Munson Airfield	1,460 <sup>b</sup>
Brewton Municipal Airport	165,500 <sup>c</sup>
Bob Sikes Airport	48,600 <sup>c</sup>
Harold NOLF Heliport	180,000 <sup>d</sup>
Northwest Florida Regional Airport	57,027 <sup>c</sup>
Peter Prince Field	94,000 <sup>c</sup>
Santa Rosa Naval Outlying Field	185,000 <sup>d</sup>
Whiting Field NAS North	70,000 <sup>d</sup>
Whiting Field NAS South	130,000 <sup>d</sup>
Dotson Airport	NR
George T McCutchan Airport	NR
Golden Harvest Flying Service Incorporated Airport	NR
Lonesome Pines Airport	NR
Sky Ranch	NR
Thomas Farms Airport	NR
Yellow River Airstrip	NR

NAS = Naval Air Station; NOLF = Naval Outlying Landing Field; NR = no report

a. Private airfields listed are located within approximately 3 miles from the forest. Larger public airports listed are located within approximately 10 miles of the forest.

b. Colburn, 2013

c. FAA, 2013

d. U.S. Air Force, 2011a

The Crestview Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid (VORTAC), which is located near BRSF, is a convergence point of victor routes 198, 241, 115, and 329. Victor routes extend vertically from 1,200 feet AGL up to but not including 18,000 feet MSL. Aircraft transiting the area en route to northwest Florida typically travel through the North-South Corridor located between R-2915A and R-2914A.

Class C airspace associated with NAS Whiting Field overlies BRSF at altitudes between 1,400 and 4,200 feet MSL at distances between 5 and 10 nautical miles (NM) from the field. At distances less than 5 NM from NAS Whiting Field, Class C airspace extends from 4,200 feet MSL to the surface. Aircraft entering Class C airspace must first establish two-way communications with the ATC tower.

## 5.2.2 Environmental Consequences

### *Proposed Action and Subalternative 1 (Preferred Alternative)*

As discussed in Section [3.2](#), airspace management and use would only be potentially adversely affected by aircraft operations. Other Proposed Action and Subalternative 1 effectors are not addressed in this section. Impacts would generally be the same under the Proposed Action and Subalternative 1, with the potential for impacts less under Subalternative 1 as a result of the proposed decrease in level of activity as compared to the Proposed Action.

Implementation of the Proposed Action or Subalternative 1 would increase military aircraft activity in the airspace above BRSF. As many as six sorties per annual average day under the Proposed Action or three sorties per annual average day under Subalternative 1 could be conducted over BRSF. Under either action alternative, each sortie would include up to four aircraft. Section [2.3](#) describes types of GLI training events, including the expected frequency of occurrence. Impacts of the Proposed Action and Subalternative 1 to Airspace Management and Use would be the same with the exception of Subalternative 1 including slightly fewer sorties per average day.

Aircraft conducting GLI training would operate in compliance with all federal aviation regulations. The training would not require segregation from nonparticipating aircraft nor would it have to occur in SUA. No new SUA or modifications to existing SUA would be required to support the proposed training, nor would any modifications to existing non-SUA boundaries be needed.

#### 5.2.2.1 Scheduling/Coordination

As described in Section [5.2.1](#), BRSF is overlain by several special use airspace units (see [Figure 5-21](#)). Most GLI aircraft training would be conducted below the 1,000-foot AGL floor altitudes of the Eglin MOAs and the 10,000-foot MSL floors of the Pensacola MOAs. R-2915A overlies a small portion of southern BRSF and extends from the surface to unlimited altitude. In keeping with current mission planning procedures, SUA managing agencies would be contacted prior to the mission to ensure airspace availability. As most GLI missions would use altitudes not included in SUA, the number of missions requiring the use of existing SUA would be expected to be low. Current internal DoD scheduling procedures would be expected to be sufficient to handle minor increases in SUA usage rates.

As discussed in Sections [1.3](#) and [1.4](#), the intent of the GLI is to provide military units with compatible locations that can serve as an outlet for training activities when they are otherwise unable to meet their requirements using current military training areas. Implementation of the Proposed Action or Subalternative 1 would reduce scheduling and coordination concerns related to the Eglin Range Complex.

Operations in alert areas such as A-292 do not require exclusion of other aircraft operations, and nonparticipating aircraft transit the alert area frequently while training is under way. Knowing that an alert area supports a high volume of pilot training flights, pilots operating in the alert area practice the “see-and-avoid” method. GLI training

operations in portions of A-292 located above BRSF would not affect scheduling of the airspace, because the airspace is not scheduled.

Sorties on MTRs may also occur simultaneously with other military training in the same area. Operations on IR-059/IR-057 and IR-021 that traverse BRSF would not need to be scheduled to not occur outside the times of GLI training events. Pilots involved in GLI training would be made aware of scheduled MTR traffic during mission planning and pre-flight briefings.

GLI training missions would be coordinated with BRSF to ensure de-confliction with all BRSF activities. This coordination would be a new process and conducted prior to any GLI aircraft operation.

### 5.2.2.2 Efficiency of Ongoing Operations

As discussed previously, GLI was devised in part to reduce scheduling conflicts on the Eglin Range by making training areas available for compatible non-hazardous training activities when conflicts inhibit them from taking place on the Eglin range. Implementation of the Proposed Action or Subalternative 1 would have a beneficial impact, in that it would permit continued growth in the tempo of testing and training operations on Eglin Range. Increased usage of SUA over BRSF (i.e., Eglin A and B MOAs) would be expected to be minimal as the floor altitude of those airspace units is higher than the altitude at which most GLI training would occur.

GLI training events would be conducted in compliance with all federal aviation regulations, operating in essentially the same manner and following the same rules as civilian aircraft. Much of the training would be conducted in Class G uncontrolled airspace. In Class G airspace, ATC does not provide separation, and aircraft would practice the see-and-avoid method at all times during training. Prior to entering Class C airspace associated with NAS Whiting Field, aircraft conducting GLI training would contact ATC to request permission to enter. There would be a minor increase in the number of aircraft handled by NAS Whiting Field ATC. Aircraft transiting the region on victor airways typically fly at altitudes higher than those proposed for GLI training. There would be little potential interaction between GLI training and operations on victor routes.

Coordination between the Air Force and State Forest POCs would be conducted to ensure that the efficiency of ongoing FFS activities would not be negatively affected. As long as this scheduling is conducted per the agreement between the Air Force and the FFS, no conflicts should occur.

### 5.2.3 Airspace Impact Summary

[Table 3-5](#) describes the context, intensity, and duration factors utilized in analysis for impacts to airspace; based on these factors the Air Force has identified insignificant adverse impacts to airspace. In summary, airspace management impacts would be regional and would include some positive impacts (i.e., reduced scheduling conflicts at Eglin Range) and some negative impacts (i.e., increased air traffic in controlled and

uncontrolled airspace over BRSF). Impacts on scheduling and coordination processes would be moderate. Implementation of a coordination process between the Air Force and FFS would avoid potential operational conflicts that otherwise could be considered severe. Potential increases in scheduling demand for SUA over BRSF would be expected to be minor. Impacts to ongoing operations would be expected to be minor, as the proposed GLI training would not require blocking off a volume of airspace to be used exclusively by Air Force aircraft. Other operations would be able to continue to transit the area while GLI training is under way. Impacts would last for the entire life of the action, as air traffic tempo over BRSF would remain slightly elevated for as long as GLI training continues.

[Table 5-4](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-4. Proposed Action/Subalternative 1 Airspace Impacts Summary – BRSF**

Effector	Airspace Management Impacts	
	Scheduling/Coordination	Efficiency of Ongoing Operations
Aircraft Operations	<b>Proposed Action:</b> Use of existing scheduled airspace (e.g., SUA) would be relatively infrequent. New coordination process would be implemented between Air Force and FFS to avoid operational conflicts. <b>Subalternative 1:</b> Same as the Proposed Action, with less potential for impact due to reduced number of potential aircraft operations.	<b>Proposed Action:</b> Increased air traffic primarily at low altitudes over BRSF. See-and-avoid procedures used in uncontrolled airspace. Minor increases in ATC workload for operations transiting controlled airspace such as NAS Whiting Field Class C airspace. Coordination between Air Force and FFS would avoid operational conflicts. <b>Subalternative 1:</b> Air traffic would be slightly less than the Proposed Action; however, impacts would be relatively the same with regards to airspace operations efficiency.

ATC = air traffic control; BRSF = Blackwater River State Forest; SUA = special use airspace; FFS = Florida Forest Service; NAS = Naval Air Station

## 5.2.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for airspace management have been identified. All General Operational Constraints (Section [2.5](#)) and Proposed Resource-Specific Mitigations identified previously in Section [3.2.4](#) would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 5.3 NOISE

### 5.3.1 Affected Environment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

The noise environment at BRSF is generally the same for both the Proposed Action and Subalternative 1. BRSF is used for recreational activities such as camping, hiking, hunting, fishing, and horseback riding, as well as for commercial activities such as logging. Ground vehicles, including passenger vehicles and heavy trucks, use the



roads and trails on BRSF. Privately held parcels of land in BRSF are used for agriculture/silviculture and low-density residential development. USEPA has stated 44 dB and 51 dB as typical DNL noise levels at a farm area and a low-density residential area, respectively (USEPA, 1974). In a study of four Department of Interior Conservation areas in Florida, existing ambient sound levels, excluding aircraft, ranged from 31.2 dB  $L_{eq}$  to 64 dB  $L_{eq}$ , with the majority of sound levels being between 45 dB  $L_{eq}$  and 55 dB  $L_{eq}$  (Fleming et al, 1999). Based on measured noise levels in similar settings, ambient noise levels (i.e., while military training is not under way) in BRSF are assumed to be approximately 45 dB DNL, although it is recognized that average noise levels in certain very remote areas within the ROI are lower. SUA over BRSF is used by several types of military aircraft. [Table 5-5](#) lists noise levels generated by individual overflights of several aircraft that use the training airspace over BRSF. Under current conditions, F-35 operations above BRSF are relatively infrequent.

**Table 5-5. SEL Under the Flight Track for Aircraft Commonly Operating Above BRSF**

Aircraft	SEL in dB <sup>1</sup>			Power	Speed (kts)
	500 feet AGL	1,000 feet AGL	10,000 feet AGL		
F-35A <sup>2</sup>	127	120	94	95% ETR	475
A-10	97	91	55	5333 NF	325
C-130H	96	91	70	970 CTIT	180
T-6	98	93	73	100% engine torque	160
H-60	91	87	N/A	LFO Lite 140 kts	140
Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
UH-1	96	91	73	100% RPM	80
CV-22	87	84	67	LFO 200 kts	200

AGL = above ground level; dB = decibels; CTIT = turbine inlet temperature in degrees Celsius; ETR = engine thrust request; kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; LFO 200 kts = helicopter in level flight at 200 knots; NF = fan speed; RPM = revolutions per minute; SEL = sound exposure level

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

The Eglin MOAs are used by a wide variety of aircraft primarily in conjunction with the adjacent Eglin Range. Eglin A and B MOAs are used for approximately 2,200 and 1,700 sorties per year, respectively. Pensacola North MOA is used primarily by T-6 and T-45 aircraft based at Whiting Field NAS for about 1,800 sorties per year. Even while operating at the lowest altitude in the MOA (i.e., MOA floor altitude) of 10,000 feet AGL, individual overflight noise levels generated by T-6 and T-45 aircraft are relatively low. The MTRs IR-021, IR-057, and IR-059 traverse BRSF but are used relatively infrequently. IR-021 is used for about 26 sorties per year, while IR-059 and IR-057 are used rarely. Since MTR operations are infrequent, they are a relatively insignificant part of the noise environment. R-2915 is used for approximately 6,953 sorties annually. Under current conditions, the noise level beneath R-2915A is 61 dB DNL<sub>mr</sub>, and the noise levels generated by other SUAs and MTRs overlying BRSF is below 45 dB DNL<sub>mr</sub>.

Civilian aircraft operations, including operations by FFS rotary- and fixed-wing aircraft, also occur over BRSF. The Blackwater Airfield is used for about two aircraft operations per average day, which consist primarily of single-engine Cessna aircraft. Baseline noise levels at Blackwater Airfield do not exceed 55 dB DNL.

Munitions noise generated on Eglin Range, which is located south of BRSF, may be audible at BRSF, particularly when large high-explosives munitions are detonated. Munitions noise becomes a less significant part of the noise environment in portions of BRSF farther from Eglin Range.

### 5.3.2 Environmental Consequences

As discussed in Section 3.3, adverse impacts may potentially occur from UoEX and aircraft operations. Other Proposed Action and Subalternative 1 effectors are not addressed in this section.

[Figure 5-11](#) through [Figure 5-20](#) show the noise protection levels associated with noise-generating operations at BRSF. Ground vehicles would follow variable routes to and from training locations in the state forest; under Subalternative 1 potential flight paths to proposed LZs/DZs have been identified. Aircraft en route typically operate at or above 500 feet AGL unless operating within existing SUA. Areas outside the state forest would occasionally experience aircraft and surface vehicle noise at levels listed in [Table 3-10](#) and [Table 3-14](#) generated by vehicles en route. However, because routing would vary from one training mission to the next, overflight/pass-by of any given location would be infrequent, and noise impacts outside the state forests would be minimal.

#### 5.3.2.1 Air Operations

##### *Proposed Action*

At BRSF under the Proposed Action, as many as six sorties per annual average day distributed among active LZs/DZs would be conducted as part of LLHI/E, AD, A/LVL, and OHO training. Each training event could include up to four aircraft but only one or two under normal circumstances. The experience of a person on the ground would vary depending on the person's location relative to the training location and the mission being conducted. In general, one or more aircraft would maneuver to the training location using variable routing at not less than 500 feet AGL. On nearing an LZ/DZ, the aircraft would descend along a pre-approved flight path, avoiding known noise-sensitive locations by at least 200 feet. Maneuvers and any additional approaches to the LZ/DZ would also avoid known noise-sensitive locations by 200 feet. Training, including maneuver, approaches, and hover, would typically last 2 hours or less. About 20 percent of total annual operations would occur at least partially after 10:00 PM, with the majority of these late-night operations taking place in summer months when the sun sets later. LZ/DZs would be sited in locations greater than 2,200 feet from known noise-sensitive locations to minimize the likelihood of direct overflights of people at low altitudes.

The Blackwater Airfield would support A/LVL training under both the Proposed Action and Subalternative 1. Operations by rotorcraft such as the CV-22 are generally louder than light propeller-driven aircraft, and the full spectrum of LZ/DZ training would only be conducted in the northern half of the Blackwater Airfield. At the Blackwater Airfield, GLI training aircraft would arrive from the north and depart toward the north to avoid overflight of the Krul Lake Recreation Area, which includes a campground. Takeoff roll would be initiated from approximately midfield to minimize noise impacts to the campground. The number of LLHI/E events per average annual day would be lower under Subalternative 1 (2 per year) than under the Proposed Action (2 per month), but the frequency of all other training events would be the same under both action alternatives. Because LLHI/E training would make a small contribution to overall noise levels at Blackwater Airfield, noise contours for the two action alternatives are not visibly different.

A map showing the area potentially exposed to noise levels greater than 55 dB DNL under the two action alternatives is shown in [Figure 5-22](#). [Table 5-6](#) compares baseline aircraft and those proposed under the GLI. Under both action alternatives, A/LVL would be the most frequent training event, and the dominant noise source. The frequency of occurrence of A/LVL would be the same under the Proposed Action and Subalternative 1, and time-averaged noise levels would be similar as well. The distance at which noise levels would decrease to below 55 dB DNL would differ under the two action alternatives by only about 200 feet (about the width of the line on the map). The area potentially exposed to noise levels greater than 55 dB DNL is represented in [Figure 5-22](#) using a single line. No known noise-sensitive areas are included within the area potentially exposed to greater than 55 dB DNL under the Proposed Action or Subalternative 1. At the Blackwater Airfield, light aircraft currently make approaches and departures without operational restrictions, although these operations occur almost entirely during daytime hours.



**Figure 5-22. Blackwater Airfield DNL**

**Table 5-6. Comparative SEL Under the Flight Track for Representative Aircraft Types at BRSF**

Aircraft Category	Aircraft type	SEL in dB <sup>1</sup>			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types to be used in GLI training (also currently fly in existing SUA over BRSF)	2-engine, propeller-driven <sup>2</sup>	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
Aircraft types operating in SUA over BRSF (not involved in GLI)	F-35A <sup>3</sup>	127	120	94	95% ETR	475
	A-10	97	91	55	5333 NF	325
	Single-engine, Propeller-driven Aircraft	84	79	61	70% RPM	160
	UH-1 (FFS and others)	96	91	73	100% RPM	80
	T-6	98	93	73	100% engine torque	160

AGL = above ground level; BRSF = Blackwater River State Forest; CTIT = turbine inlet temperature in degrees Celsius; ETR = engine thrust request; GLI = GRASI Landscape Initiative; hp = horsepower; kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; NF = fan speed; SUA = special use airspace; RPM = revolutions per minute

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. C-23 Sherpa used as surrogate noise source for various small, propeller-driven aircraft types involved in GLI; C-23 is powered by two 1,198-hp engines, while CASA-212, PC-12, and M-28 are powered by pairs of 900-hp, 850-hp, and 1,100-hp engines, respectively.

3. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

### **Subalternative 1 (Preferred Alternative)**

Under Subalternative 1, there would be about 3 sorties per average annual day distributed amongst the different LZs/DZs as identified in Section 2.5. Operations noise, whether it is generated by a direct overflight or training at a distance, could be disruptive of activities (e.g., conversation, sleeping) and could be considered annoying. Several LZ/DZs would be established, and any given training locations would be used for less than one training event per day on average. Under a conservative set of assumptions, which are described in Section 3.3.3 and in more detail in Appendix H (Section H.3), noise levels exceeding 55 dB DNL would not affect any known noise-sensitive locations. Several aircraft currently operating in the airspace above BRSF, such as the A-10 and F-35, generate noise levels higher than those typically generated by aircraft that would be involved in GLI training. Military aircraft, such as the F-35, do not normally fly over BRSF at levels below 1,000 feet AGL (the floor altitude of Eglin MOAs) except in R-2915.

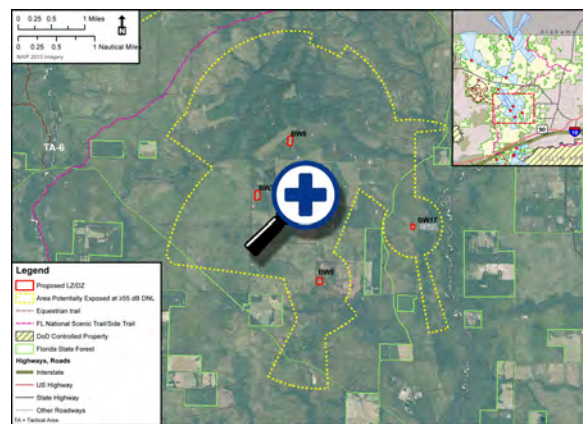
Maps showing areas potentially exposed to noise levels exceeding 55 dB DNL are shown in Figure 5-23 through Figure 5-27. As discussed in Section 3.3.3, a highly conservative approach was taken in determining areas potentially exposed at greater than 55 dB DNL. Whereas the areas potentially affected by noise levels in excess of 55 dB DNL were delineated for a scenario under which all inbound and outbound flights take place on a single flight path, actual flight paths would vary from one mission to the



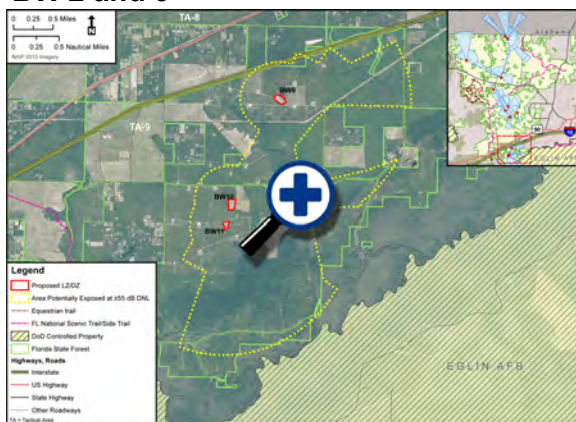
next resulting in fewer direct overflights of any given location and lower time-averaged noise levels than 55 dB DNL. Areas potentially exposed to noise levels exceeding 55 dB DNL were identified assuming that the single approach and departure flight path could be located anywhere within the potential fly zone defined through the aeromapping process (see Section 2.5 and 3.3.1.2). As is the case at Blackwater Airfield, the potential extent of area exposed to 55 dB DNL would be similar under the Proposed Action and Subalternative 1 and this area is depicted in Figure 5-23 through Figure 5-27 using a single line. The reason for the similarity of time-averaged noise levels under the two action alternatives near the LZs is because the number of A/LVL training events, the largest contributor to overall noise levels, would be the same under both action alternatives. The other training events (e.g., Airdrops) contribute relatively little to overall noise levels.



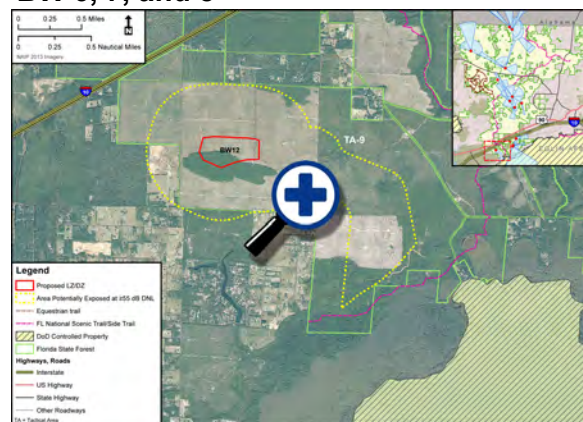
**Figure 5-23. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 2 and 3**



**Figure 5-24. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 6, 7, and 8**



**Figure 5-25. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 9, 10, and 11**

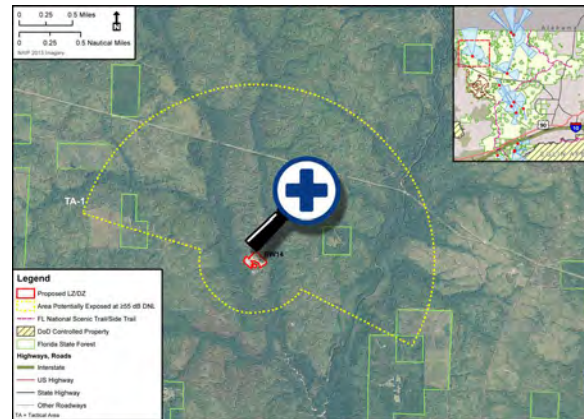


**Figure 5-26. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 12**





**Figure 5-27. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 13**



**Figure 5-28. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 14**

No known noise-sensitive locations exist within the areas potentially exposed to greater than 55 dB DNL developed using this highly-conservative method of delineation. As can be seen in [Figure 5-27](#), a portion of a single privately-owned parcel located southeast of BW13 could potentially be exposed to noise levels greater than 55 dB DNL but examination of aerial photography reveals that the residence located on this parcel is located outside of the area potentially exposed to 55 dB DNL. A privately-owned parcel located less than 2,200 feet southwest of BW12 does not include any residences according to available data sources (see [Figure 5-26](#)).

### 5.3.2.2 Munitions Use

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Under both the Proposed Action and Subalternative 1 firing of blank rounds and ground burst simulators would only take place at the STOP Camp and the SRYA. Paintball/plastic pellets and smoke grenades would be used at other locations under the Proposed Action, but use of these expendables generates minimal noise.

The former STOP Camp is located 1,650 feet from the nearest privately owned land and about 1,900 feet from the nearest structure visible on available aerial photos. The SRYA is located about 1,350 feet from the nearest privately owned land parcel and about 5,000 feet from the nearest structure visible in available aerial photos. The noise generated by blank rounds may be alarming to residents living on privately owned parcels and transient users of BRSF, particularly if it occurs outside of hunting season or at night. The areas potentially exposed to munitions noise at greater than impact levels is shown in [Figure 5-29](#). This area would exceed impact



**Figure 5-29. Area Exposed to Elevated Large-Arms and Small-Arms Munitions Noise**

levels at known noise-sensitive locations (i.e., residences). Detonation of ground burst simulators would be expected to be disturbing and possibly alarming to people nearby. To avoid unnecessary concern among local residents, the Air Force would notify adjacent residents of any upcoming training events that use munitions.

### **5.3.2.3 Ground Vehicle Operations**

#### ***Proposed Action***

Under the Proposed Action, as discussed in Section [3.3.3](#), ground vehicle operations (e.g., Roadway Vehicle Use, BD, and OFVO) may generate noise that is annoying to people in the state forest or private inholdings, particularly when it occurs at night. Noise levels generated by two of the loudest vehicles expected to be used during GLI training are listed in [Table 3-14](#). Ground vehicles used in GLI training would be equipped with exhaust mufflers in compliance with Florida Statutes. Training would occur along roads that are used currently by heavy trucks (e.g., logging trucks) and other traffic. Noise impacts would be localized to the area where ground vehicles are operating and would be limited to the duration of the training event.

#### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1 noise impacts would be generally the same, with less potential for noise impacts from vehicle operation due to the reduced scale of training activities as described under Section [2.4](#).

### **5.3.2.4 Amphibious Operations**

#### ***Proposed Action***

Under the Proposed Action AO would involve up to six watercraft equipped with motors up to 200 hp. These boats would generate noise that could be considered disruptive and annoying by people along the banks of the water body being used. The boats would be of a similar size and engine power to boats currently used on the same waterbodies, and would not be expected to exceed noise level thresholds established in Florida Statutes. During covert training operations in confined water bodies, full throttle would be expected to be used rarely, limiting the intensity of noise generated. This type of training could occur up to 10 times per year in waterbodies where motor-powered boats are currently permitted. Noise impacts would be expected to be temporary, lasting the duration of the training exercise.

#### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1 this activity would not occur; therefore there would be no noise impacts associated with this activity.

### **5.3.3 Noise Impact Summary**

#### ***Proposed Action and Subalternative 1 (Preferred Alternative)***

[Table 3-8](#) describes the context, intensity, and duration factors utilized in analysis of impacts to noise receptors; based on these factors the Air Force has identified some

insignificant noise-related impacts to public health and safety and the human and natural environment. Noise associated with aircraft operations and munitions use would result in annoyance associated with activity interference to some recreational users and residences. Given the context of the BRSF existing noise environment and intensity of potential noise levels resulting from the Proposed Action and Subalternative 1, noise levels would not be sufficiently intense to exceed recommended guidelines. As a result, adverse impacts associated with annoyance for those people not participating in the training can be expected. People involved in training would wear hearing protection as required by DoD regulations. Activities such as munitions training and aircraft operations are either not regulated or are specifically exempt from local noise regulations. Ground vehicles and watercraft used during GLI training would be expected to generate noise levels below thresholds established in Florida Statutes. Implementation of operational constraints identified in Section 2.5, as well as Proposed Resource-Specific Mitigations in the previous analysis, would minimize potential noise annoyance and, in most cases, minimize noise to a negligible level.

[Table 5-7](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-7. Proposed Action/Subalternative 1 Noise Impacts Summary – BRSF**

Effector	Training Location								
	Distributed Ops	Blackwater Airfield	Nominal LZ/DZ	All Subalternative 1 DZs	Nominal OHO Location	STOP Camp	SRYA	Nominal Ground Vehicle Training Location	Nominal Body of Water (Amphibious Training)
Land Disturbance	1	N/A	N/A	N/A	N/A	1	1	N/A	N/A
Wheeled Vehicle Movement	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A
Use of Expendables	N/A	N/A	N/A	N/A	N/A	3	3	N/A	N/A
Aircraft Operations	4	5	5	6	5	N/A	N/A	N/A	N/A
Amphibious Operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1*

DZ = drop zone; LZ = landing zone; N/A = not applicable; OHO = overwater hoist operations; Ops = operations; STOP = Short-Term Offender Program; SRYA = Santa Rosa Youth Academy; TA = tactical area

\*Would not occur under Subalternative 1

1. Localized, short-term, and low-intensity noise.

2. Localized, short-term, individual wheeled vehicle noise events may be annoying to residents and transient users.

3. Localized, recurring events over long term. Munitions noise thresholds exceeded at known noise-sensitive locations (e.g., residences), and management actions are needed to reduce level of impacts to what would be expected to be perceived as moderate.

4. Aircraft maneuver noise affects wide area; recurring events; minimum altitude applied to reduce impacts to levels expected to be considered moderate.

5. Aircraft affects localized area; recurring events; noise thresholds are exceeded and measures must be applied during site selection and mission planning to reduce impacts to levels expected to be moderate.

6. Noise from aircraft operation may be annoying to forest users. However, application of LZ/DZ and approach/departure path selection criteria have resulted in no noise-sensitive locations being exposed to noise in excess of impact levels.

### 5.3.4 Proposed Resource-Specific Mitigations

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

In addition to the mitigations for noise identified in Section [3.3.4](#), the following BRSF-specific noise mitigations would further minimize noise impacts. While noise impacts can be minimized, they cannot be completely avoided, due to the transient nature of training activities and recreational users, and the varying perception of annoyance among members of the public:

- A/LVL training aircraft inbound to and outbound from the Blackwater Airfield would avoid overflying privately owned parcels with residential structures where practicable.
- Approaches to and departures from Blackwater Airfield would be conducted from/to the north to avoid low overflight of a campground.
- Aircraft departing Blackwater Airfield would initiate takeoff roll from about the center point of the airstrip.
- LZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be permitted in the northern half of Blackwater Airfield.
- The Air Force would notify residents within 4,000 feet of the SRYA or former STOP Camp prior to use of munitions.

[Figure 5-11](#) through [Figure 5-20](#) show the areas in which training activities would be restricted based on buffer distances described above and in Section [3.3.4](#). Buffers would be established for all privately owned parcels containing at least one residential structure and all campgrounds.

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## 5.4 SAFETY

### 5.4.1 Affected Environment

The affected environment for safety as it relates to proposed activities comprises the policies and procedures currently in place at Eglin AFB, previously discussed in Sections [3.4.2](#) and [3.4.3](#). The BFC of the FFS is primarily responsible for emergency or fire response at BRSF. The BFC is also responsible for prevention, detection, and suppression of wildfires, as well as responding to other emergencies at BRSF, such as accidents. The BFC encompasses Escambia, Santa Rosa, and Okaloosa Counties.

Since January 2010, on average there have been 126 wildfires annually caused by various sources such as campfires, debris burning, lightning, and children at BRSF ([Table 5-8](#)). Of those, only about six were caused by equipment/vehicle use.

**Table 5-8. Average Wildfires by Cause at BRSF**

Cause	Fires Total	Fires Annual Average	Acres Total	Acres Annual Average
Campfire	9	2.2	130.4	32.6
Children	25	6.2	159.5	39.9
Debris burn, authorized	88	22	2,048.8	512
Debris burn, nonauthorized	63	15.7	276.9	69.3
Equipment use	24	6	600.6	150
Miscellaneous	38	9.4	570.4	142.7
Fireworks	7	1.8	52.4	13.1
Power lines	11	2.8	44.2	11
Incendiary	83	20.8	1,426.00	356.5
Lightning	43	10.8	416.8	104.2
Smoking	6	1.5	285.2	71.3
Unknown	106	26.5	1,552.80	388.2
<b>Total</b>	<b>503</b>	<b>125.7</b>	<b>7,564</b>	<b>1,890.8</b>

Source: FFS, 2013a

To respond to potential fires, BFC has 29 forest rangers and senior forest rangers that are certified wildland firefighters in the three-county area. BFC also has 5 primary certified wildland firefighter supervisors and an additional 12 certified wildland firefighters to assist in suppressing and managing wildfires in the district. All certified personnel can be utilized for suppressing wildfires at BRSF.

BFC firefighting equipment includes 14 John Deere 650 bulldozers (Type 2) with plows and 2 heavy bulldozers (Type 1 and 2) without plows for wildfire suppression and fire line reinforcement. All bulldozers have an accompanying transport for moving the equipment. In addition, the district has seven Type 6 and two Type 4 wildland engines available for fire response. Specialized equipment available for wildfire use includes a mechanic truck for field repairs, portable fuel tanks, small water tenders, an excavator, and various pickup trucks and sport utility vehicles (SUVs). The FFS also maintains a UH-1 Type II firefighting helicopter located at Whiting Field near Milton. This equipment is available for use or support in fighting wildfires at BRSF.

Five facilities are considered primary response locations in the district. Three of those locations are located at BRSF. These locations include the headquarters at Munson, Okaloosa Forestry Station near Blackman, and Coldwater Horse Stables located southwest of Munson. The remaining primary sites are located at Milton and Molino. Secondary sites commonly used during periods of elevated wildfire risk are located in Laurel Hill, Holt, Ensley, and Navarre.

To mitigate wildfire risk, BRSF has an aggressive prescribed burning program. Upland forest lands are burned an average of every three to four years. This prevents high accumulations of vegetation that would fuel catastrophic wildfires.

The BFC cooperates with local county, state, and federal resources to suppress wildfires in the local area. Cooperative agreements exist at the state and local level to



allow paid and volunteer fire departments to assist with wildfire suppression and structure protection. The following fire departments commonly assist with wildfires at BRSF: Berrydale Volunteer Fire Department (VFD), Munson VFD, Blackman VFD, Baker VFD, North Okaloosa VFD, Holt VFD, Harold VFD, East Milton VFD, Skyline VFD, and U.S. Navy Whiting Field Fire Department. Other surrounding fire departments may assist as needed.

The FFS also maintains cooperative wildfire assistance agreements with Jackson Guard at Eglin AFB, U.S. Forest Service, FWC, the NFWFMD, and the Longleaf Alliance Ecosystem Support Team. Each organization has a variety of conventional or specialized equipment and/or personnel available for significant wildfire incidents at BRSF. The FFS also has agreements with the Florida Highway Patrol and Florida Department of Transportation to provide road closures and or signage necessary for smoke events on federal and state highways.

The FFS monitors weather conditions daily for wildfire planning and burning authorization purposes. The BFC records rainfall at various locations, calculates the National Fire Danger Rating System values daily, and sets fire preparedness levels. The FFS also monitors and estimates the Keetch-Byrum Drought Index (KBDI) and FDI for the state of Florida.

#### **5.4.2 Environmental Consequences**

##### ***Proposed Action***

As discussed in Section [3.4](#), potential adverse impacts may occur from wildfire associated with Use of Expendables. Other Proposed Action effectors are not addressed in this section.

Impacts to BRSF associated with safety would be the same as those described in Section [3.4](#). The Proposed Action would not negatively affect the ability to provide for safe operation of aircraft or other equipment, nor would it result in uncontrollable safety hazards to military personnel, the public, or property. Implementation of established procedures, as discussed in Sections [3.4.2](#) and [3.4.3](#), would ensure that activities associated with the Proposed Action would not result in significant impacts to safety.

At BRSF, campfires are only allowed at designated camp sites, which would not be used by training personnel. However, campfires may potentially be utilized at the hardened camp sites in designated fire pits. No campfires would be utilized in the interstitial areas of BRSF. To minimize the potential for fires caused by the Use of Expendables and general training activities (such as idling vehicles), before a mission begins units would obtain the daily fire danger rating and would coordinate with FFS personnel to ensure that adequate fire response is available, if needed per General Operational Constraints identified in Section [2.5](#). Units must also appoint a fire marshal on a daily basis (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while in the field to ensure all personnel have been trained concerning the safe use of incendiary devices and to supervise the immediate

suppression of fires. These wildfire mitigations will be implemented on state-owned or leased land as part of the proposed action.

Under Florida law, it is unlawful for any person to set fire to, or cause fire to be set to, any wildlands or to build a campfire or bonfire or to burn trash or other debris within the designated area of a severe drought emergency, unless a written permit is obtained from the division or its designated agent.

As stated in Section [2.5](#), Operational Constraint 6(a), the Air Force would police training areas to ensure that no trash, ammunition boxes, wire, or other debris has been left in the area. The Air Force will work with the FFS to establish procedures for policing and clearing residue from training sites at regular intervals; this has been added as a mitigation to Section [2.7](#) of the Final EIS. Air Force personnel would adhere to Eglin Plan 32-5 Hazardous Waste Management Plan and Eglin Plan 32-9 Hazardous Material Management Plan during training activities for recycling, hazardous materials management, and proper disposal of wastes. Additionally, the Air Force has added a "reduced-scale" sub-alternative to the EIS to address public concerns raised about munitions residue. The sub-alternative, which is the Air Force's preferred alternative, will limit the use of munitions and expendables to just two locations in BRSF. Munitions use (blanks, training aids, devices and simulators) and activities with the potential to leave munitions residue would be limited to the two hardened camp areas in BRSF STOP Camp and SRYA. The frequency of use would be limited to no more than 60 days annually. These areas would be utilized for up to eight (8) 5-day training exercises with no more than 10,000 rounds per day expended. No firing or munitions generating activities would be conducted in THSF.

The intent/objective of most of the training activities outside use of roadways or LZs within the forest is to remain unseen/unnoticed, as these are mostly Special Forces troops. Training activities within the forest outside of established roadways or LZs would typically avoid designated trails and always avoid recreational sites. Training would mainly occur in small forest management units in order to minimize interference with other users.

Personnel would avoid contact with the public to the extent possible. However, should there be an encounter military personnel would identify themselves and then suspend training activities and move away from the area, yielding to the public user. On roadways and vehicle trails military personnel would yield to the public. Section [2.5](#), Operations Constraint 3(i) provides examples of how the Air Force would coordinate with the FFS to make the public and recreationists aware of when and where training activities would occur prior to the activity. Additionally, Section [3.4](#) provides procedures that would be applied in military/civilian interactions.

Off-road vehicle use is not part of the proposed action. All vehicle use (including ATV/UTVs) will be limited to established forest roads. The use of spark arrestors or tailpipe shields are not necessary, but would be implemented if the FFS deems it necessary. The USFS generally does not require spark arrestors and tailpipe shields for vehicles that stay primarily on established roadways.

### Subalternative 1 (Preferred Alternative)

Subalternative 1 safety impacts would be similar to those of the Proposed Action, although, it would be expected that the risk of training-related fires would be reduced due to the limited training area and usage quantities associated with the use of expendables.

### 5.4.3 Safety Impact Summary

[Table 3-16](#) describes the context, intensity, and duration factors utilized in analysis for impacts to safety; based on these factors the Air Force has identified some insignificant adverse public health and safety impacts to the human and natural environment. There is the potential for wildfire associated with training activities, and wildfires could result in adverse impacts. However, requirements identified in [Section 2.5](#) associated with wildfire prevention and response would minimize the potential for this impact to occur. Therefore, based on the context, intensity, and duration of identified potential safety impacts, the Air Force has not identified any significant safety impacts. [Table 5-9](#) summarizes the impacts identified for both the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-9. Proposed Action/Subalternative 1 Safety Impacts Summary – BRSF**

Effector	Safety Receptor Type (Applies to All BRSF TAs)	
	Military Personnel	General Public
Land Disturbance		
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with these activities (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impacts less than the Proposed Action due to the reduced level of proposed activity.	
Point impact		
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impacts less than the Proposed Action due to the reduced level of proposed activity.	
Dismounted maneuver		
Use of Expendables		
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with these activities (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> The potential for wildfire would also be substantially less given restricted expendable use.	<b>Proposed Action:</b> Risk of wildfire is increased due to Use of Expendables (GBSs at the hardened camp sites, smoke grenades, generators, etc.), which could affect the safety of the general public. However, GBS use would be restricted to hardened camp sites, thus reducing wildfire potential due to low fuel load associated with improved grounds, and the increase in potential wildfires caused by idling vehicles and other equipment would be negligible. While the risk of wildfire is unavoidable under the Proposed Action, General Operational Constraints, as well as fire management
Smoke grenades		
Other/equipment		

**Table 5–9. Proposed Action/Subalternative 1 Safety Impacts Summary – BRSF, Cont'd**

Effector	Safety Receptor Type (Applies to All BRSF TAs)	
	Military Personnel	General Public
		procedures implemented by both Eglin AFB personnel and the FFS, would serve to minimize this potential (see Section 5.4.2). <b>Subalternative 1:</b> Impacts would generally be the same, with the potential for wildfire substantially less given restricted expendable use.
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> Aircraft operations would be significantly less than those under the Proposed Action and associated potential impacts would be less.	
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> This action would not take place.	
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impacts less than the Proposed Action due to the reduced level of proposed activity.	

AFB = Air Force Base; BRSF = Blackwater River State Forest; FFS = Florida Forest Service; GBS = ground burst simulator; TA = tactical area

#### 5.4.4 Proposed Resource-Specific Mitigations

All constraints and mitigations, mainly associated with wildfire prevention, are identified in Section 3.4.3. While these would minimize the potential for wildfire probability, the potential for increased wildfires cannot be completely avoided under the Proposed Action. Thus, the potential for adverse safety impacts at BRSF remains. The increased potential for wildfire probability can only be avoided through implementation of the No Action Alternative.

### 5.5 AIR QUALITY

#### 5.5.1 Affected Environment

BRSF is located in both Santa Rosa and Okaloosa Counties. Both counties are in attainment for all criteria pollutants (USEPA, 2014).

Baseline emissions for Okaloosa and Santa Rosa Counties are presented in Table 5-10. These emissions data were acquired from the USEPA's 2011 NEI data for Okaloosa and Santa Rosa Counties (USEPA, 2014a). The county data include emissions data from point sources, area sources, and mobile sources.

**Table 5-10. Baseline Emissions Inventory for Okaloosa and Santa Rosa Counties**

County	Pollutant (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Okaloosa	55,324	6,181	11,149	4,031	519	46,406	3,247,863
Santa Rosa	57,020	6,771	14,019	4,755	1,150	49,600	1,699,518

Source: USEPA, 2013

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

## 5.5.2 Environmental Consequences

### Proposed Action

As discussed in Section 3.5, potential adverse impacts to air quality may occur from fugitive dust and emissions associated with use of wheeled vehicles and expendables, and aircraft and AO. Other Proposed Action effectors are not addressed in this section.

All activities proposed at BRSF already occur at Eglin AFB, which is located in Okaloosa and Santa Rosa Counties. Emissions for these activities are currently reported in the Eglin AFB air emissions inventory and GHG inventory. The Proposed Action would involve moving the activities within the current affected county. Emissions from each training activity were compared with county emissions and impacts were determined.

Emissions for fugitive dust for each training activity are provided in Section 3.5. These emissions would cause negligible (less than 5 percent of the ROI emissions) short-term impacts to regional air quality (Table 5-11 and Table 5-12).

Wheeled vehicle emissions associated with each training activity are provided in Section 3.5. Vehicles operating in the ROI would emit negligible short-term levels of air pollutants (Table 5-12). GHG and air pollutant emissions would not exceed thresholds for significant negative impacts.

**Table 5-11. Fugitive Dust Emissions Compared with the ROI**

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
Total	5.76	42.46
BRSF ROI		8,786
% Emissions of ROI (year)		0.48%

BRSF = Blackwater River State Forest; PM = particulate matter; ROI = region of influence

**Table 5-12. Wheeled Vehicle Air Emissions Compared with the ROI**

Vehicle Air Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Total/Year	21.05	6.23	0.95	1.01	0.47	20.03	709.12
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI (year)	0.02%	0.05%	0.00%	0.01%	0.03%	0.02%	0.01%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

Training munitions emissions are provided in Section 3.5. Table 5-13 summarizes emissions from use of training munitions. The emissions calculated were for all proposed munitions, even though at BRSF only GBSs and smoke grenades would be utilized. As a result, air emissions at BRSF resulting from training munitions use would be substantially less than those provided in Table 5-13, resulting in only a small percentage of the total emissions per year. Even if all training munitions were utilized at BRSF, there would still be only a negligible impact on air quality.



**Table 5-13. Training Munitions Emissions Compared with the ROI**

Munitions Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

Aircraft emissions are provided in Section 3.5. [Table 5-14](#) summarizes emissions from aircraft operations for the different types of activities. Emissions would have a negligible impact to regional air quality.

**Table 5-14. Aircraft Emissions Compared with the ROI**

Source	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Total/Event	0.22	0.73	0.18	0.19	0.06	0.04	57.87
Total/Year	29.67	121.75	29.48	34.38	8.24	2.5	10,751
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI (year)	0.03%	0.94%	0.12%	0.39%	0.49%	0.00%	0.22%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

AO emissions are provided in Section 3.5. Emissions from such sources would have negligible, short-term impacts to regional air quality ([Table 5-15](#)).

**Table 5-15. Amphibious Operations Emissions Compared with the ROI**

Source	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
AO/event	0.00	0.00	0.00	0.00	0.05	0.44	0.44
AO/year	0.01	0.01	0.00	0.01	0.48	4.42	4.42
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI (year)	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%

AO = Amphibious Operations; BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### **Subalternative 1 (Preferred Alternative)**

Emissions under Subalternative 1 are reduced somewhat from those estimated for the Proposed Action.

Emissions for fugitive dust and wheeled vehicle emissions for each training activity are provided in Section 3.5. These emissions would cause negligible (less than 5 percent of the ROI emissions) short-term impacts to regional air quality ([Table 5-16](#) and [Table 5-17](#)). GHG and air pollutant emissions would not exceed thresholds for significant negative impacts.

**Table 5-16. Subalternative 1 Fugitive Dust Emissions Compared with the ROI**

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
Total	5.43	40.69
BRSF ROI		8,786
% Emissions of ROI (year)		0.46%

BRSF = Blackwater River State Forest; PM = particulate matter; ROI = region of influence

**Table 5-17. Subalternative 1 Wheeled Vehicle Air Emissions Compared with the ROI**

Vehicle Air Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Total/Year	15.72	6.21	0.77	0.82	0.47	14.57	693
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI (year)	0.01%	0.05%	0.00%	0.01%	0.03%	0.02%	0.01%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

Training munitions emissions are provided in Section 3.5. Table 5-18 summarizes emissions from use of training munitions under Subalternative 1. The emissions calculated were for all proposed munitions, which would only be used at the STOP and SRYA Camps at BRSF. Air emissions at BRSF resulting from training munitions use would result in only a small percentage of the total emissions per year. Impacts on air quality would be negligible.

**Table 5-18. Subalternative 1 Training Munitions Emissions Compared with the ROI**

Munitions Emissions	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Maximum emissions/year	0.14	0.02	0.75	0.21	0.00	0.00	0.30
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

Aircraft emissions are provided in Section 3.5. Table 5-19 summarizes emissions from aircraft operations for the different types of activities. Emissions would have a negligible impact to regional air quality.

**Table 5-19. Subalternative 1 Aircraft Emissions Compared with the ROI**

Source	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Total/Event	0.10	0.23	0.05	0.05	0.03	0.02	27.63
Total/Year	8.9	31.3	7.28	8.4	2.62	1.36	5,641
BRSF ROI	112,344	12,952	25,168	8,786	1,669	96,006	4,947,381
% Emissions of ROI (year)	0.01%	0.24%	0.03%	0.10%	0.16%	0.00%	0.11%

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

1. Total annual emissions were compared with the ROI for maximum impact analysis.

### 5.5.3 Air Quality Impact Summary

[Table 3-19](#) describes the context, intensity, and duration factors utilized in impact analysis for air quality; based on these factors the Air Force has not identified any adverse air quality impacts to public health and safety or the human and natural environment. In summary, training activities would result in small amounts of air emissions that would not result in exceedance of any local or regional air quality standards. While NO<sub>x</sub> emissions associated with aircraft operations may be considered adverse, given the potential increase over baseline air quality conditions, these emissions would be transient and short term in nature. [Table 5-20](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-20. Proposed Action Air Quality and Greenhouse Gas Impacts Summary - BRSF**

Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Ground Movement	0.03%	0.05%	0.01%	0.02%	0.03%	0.03%	0.02%
Use of Expendables	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aircraft Operations	0.03%	0.94%	0.12%	0.39%	0.49%	0.00%	0.22%
Amphibious Operations	0.00%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%
<b>Total % of ROI Emissions</b>	<b>0.09%</b>	<b>1.13%</b>	<b>0.14%</b>	<b>0.46%</b>	<b>0.69%</b>	<b>0.04%</b>	<b>0.29%</b>

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

[Table 5-21](#) shows the anticipated impacts based on factors identified in [Table 3-19](#). The Air Force has not identified any adverse air quality impacts to public health and safety or the human and natural environment. Under Subalternative 1, training activities would result in small amounts of air emissions that would not result in exceedance of any local or regional air quality standards.

**Table 5-21. Subalternative 1 Air Quality and Greenhouse Gas Impacts Summary - BRSF**

Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Ground Movement	0.01%	0.05%	0.00%	0.01%	0.03%	0.02%	0.01%
Use of Expendables	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aircraft Operations	0.01%	0.24%	0.03%	0.10%	0.16%	0.00%	0.11%
<b>Total % of ROI Emissions</b>	<b>0.02%</b>	<b>0.29%</b>	<b>0.03%</b>	<b>0.11%</b>	<b>0.19%</b>	<b>0.02%</b>	<b>0.12%</b>

BRSF = Blackwater River State Forest; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### 5.5.4 Proposed Resource-Specific Mitigations

In the absence of any identified adverse impacts, no Resource-Specific Mitigations for air quality have been identified.

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## 5.6 EARTH RESOURCES

### 5.6.1 Affected Environment

This section describes the geologic and soil resources within the BRSF. Discussion focuses on impact assessment resource features and issues identified in Section [3.6](#), *Earth Resources*.

#### 5.6.1.1 Geologic Resources

The following subsection discusses the physical geography and closed depressions subsidence features on BRSF.

#### Physical Geography

##### *Proposed Action / Subalternative 1 (Preferred Alternative)*

The Blackwater River watershed that generally defines the BRSF landscape is characterized by alluvial and fluvial terraces and the Citronelle Formation. Stream terraces form as one or a series of constructed and/or erosional flat-topped landforms in a stream valley that flank and are parallel to the stream channel originally formed by the previous stream level. Subsequent terraces, which may rarely or never flood, are built on the remnants of abandoned floodplain, streambed, or valley floor features (Schmidt and Coe, 1978; USDA, 1994; Hollie et al., 2010).

The Citronelle Formation is a deltaic deposit up to 340 feet thick consisting of quartz sands and gravel that are unconsolidated to poorly consolidated, very fine to very coarse, and clean to clayey. It frequently contains extremely hard cemented sandstone lens known as hardpans, which form as a result of cementation of sands by iron oxides that precipitate from groundwater. In some instances, seepage slopes and natural ponds are created by hardpans at or near the surface. As currently recognized, this formation only occurs in the Florida panhandle (Beck, 1973; Hollie et al., 2010; Maddox et al., 2002; Marsh, 1966).

#### Sensitive Karst Terrain

##### *Proposed Action / Subalternative 1 (Preferred Alternative)*

No sensitive karst terrain areas have been identified on BRSF (see Section [3.6.1.2](#)).

#### Closed Depressions

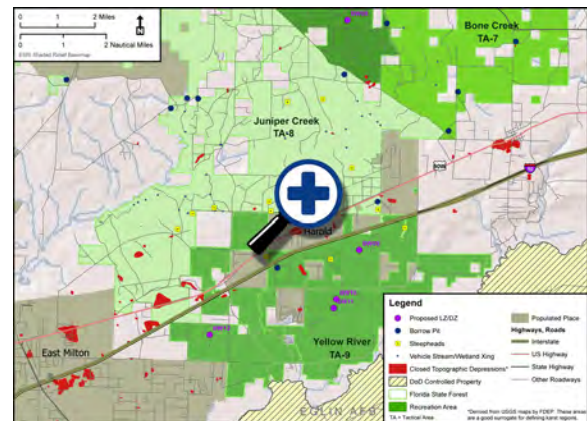
##### *Proposed Action*

There are several closed depression areas that may or may not represent sinkhole subsidence. BRSF areas designated as closed depressions are likely nonkarst features

relating to other natural geologic features or conditions created by human activities, such as buried organic materials, broken drain lines, septic tanks, or other subterranean condition. A licensed, professional geologist makes the determination if the subsidence incident is a sinkhole or closed depression. A summary of BRSF closed depression subsidence incidents are listed in [Table 5-22](#) and shown in [Figure 5-30](#). Approximately 54 percent of designated closed depressions are within the Juniper Creek tactical area (TA-8).

**Table 5-22. BRSF Closed Depression Subsidence Areas**

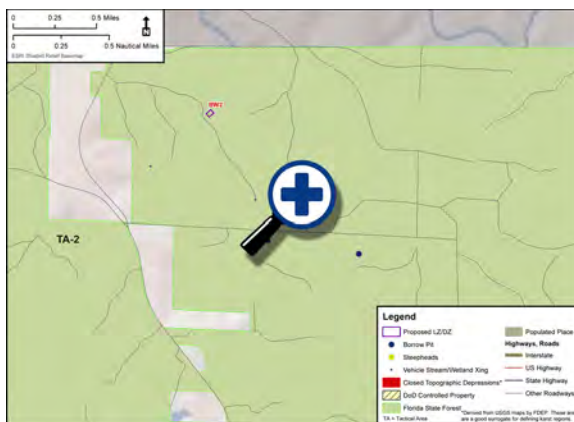
Tactical Area (TA)	Closed Depression Subsidence Areas	
	Number	Acres
Coldwater (TA-1)	1	3
Sweetwater (TA-2)	2	15
Rock Creek (TA-3)	1	1
Horse Creek (TA-4)	0	0
West Boundary (TA-5)	2	25
Floridale (TA-6)	5	17
Bone Creek (TA-7)	1	1
Juniper Creek (TA-8)	20	121
Yellow River (TA-9)	5	24
<b>Total</b>	<b>37</b>	<b>207</b>



**Figure 5-30. BRSF Closed Depressions, Steepheads, and Borrow Pits**

### **Subalternative 1 (Preferred Alternative)**

Closed depressions associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-31](#) through [Figure 5-35](#). There are no closed depressions associated with the identified LZs/DZs.



**Figure 5-31. Closed Depressions, Steepheads, and Borrow Pits – BW2 & BW3**



**Figure 5-32. Closed Depressions, Steepheads, and Borrow Pits – BW6, BW7, BW8, & BW17**





**Figure 5-33. Closed Depressions, Steepheads, and Borrow Pits – BW9, BW10, BW11, & BW12**



**Figure 5-34. Closed Depressions, Steepheads, and Borrow Pits – BW13 and Movement Corridor**



**Figure 5-35. Closed Depressions, Steepheads, and Borrow Pits – BW14**

### 5.6.1.2 Soil Resources

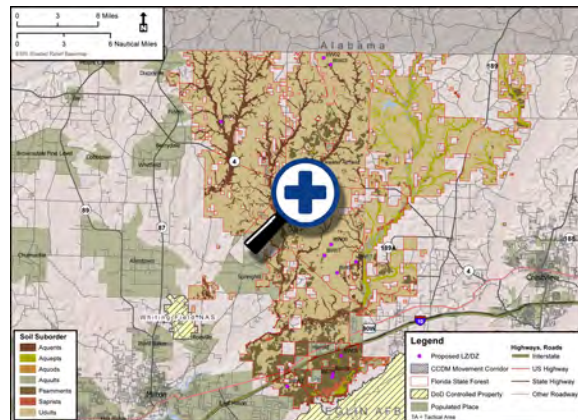
#### Soils Inventory

##### *Proposed Action*

BRSF geologic formations are the parent materials from which area soils were formed. A preeminent characteristic of the forest's upland soils that is responsible for many of its unique attributes is the broad distribution and, in most cases, dominance of quartz sand. The soil series that compose the BRSF are summarized in [Table 5-23](#) and shown in [Figure 5-36](#). Appendix E, *Earth Resources*, provides detail by tactical area.

**Table 5-23. BRSF Soils Summary**

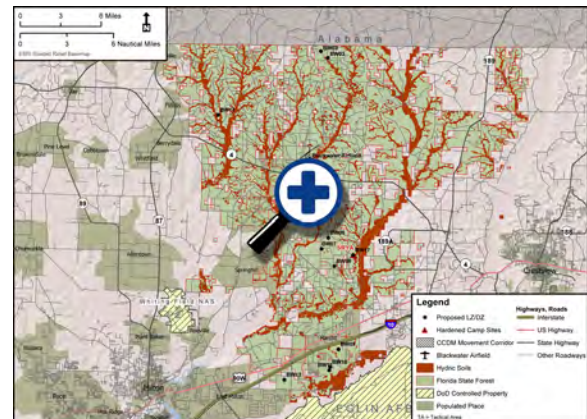
Soil Taxonomy Class	Total (acres)
1 Entisols Soil Order	1
1A Aquents Soil Suborder	1
1B Psamments Soil Suborder	1
2 Histisols Soil Order	
2A Sapristis Soil Suborder	2
3 Inceptisols Soil Order	
3A Aquepts Soil Suborder	3
4 Spodosols Soil Order	
4A Aquods Soil Suborder	4
5 Ultisols Soil Order	5
5A Aquults Soil Suborder	5
5B Udults Soil Suborder	5

**Figure 5-36. BRSF Soil Suborders**

Approximately 23 percent of the BRSF soil series are classified as hydric soils and approximately 20 percent (40,068 acres) of forest land area is designated as hydric. The majority of forest hydric soils occur along stream valleys and floodplains ([Table 5-24](#) and [Figure 5-37](#)).

**Table 5-24. BRSF Hydric Soils**

Tactical Area (TA)	Hydric Soils (acres)	Percent of TA
Coldwater (TA-1)	7,374	21
Sweetwater (TA-2)	4,963	14
Rock Creek (TA-3)	7,620	23
Horse Creek (TA-4)	2,379	21
West Boundary (TA-5)	2,807	17
Floridale (TA-6)	3,138	13
Bone Creek (TA-7)	4,774	30
Juniper Creek (TA-8)	4,121	18
Yellow River (TA-9)	2,892	24
<b>Total</b>	<b>40,068</b>	—

**Figure 5-37. BRSF Hydric Soils**

### ***Subalternative 1 (Preferred Alternative)***

Hydric soils associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-38](#) through [Figure 5-42](#). Approximately 60 acres of the Movement Corridor are hydric soils, as shown in [Figure 5-41](#).



**Figure 5-38. Hydric Soils – BW2 & BW3**



**Figure 5-39. Hydric Soils – BW6, BW7, BW8, & BW17**



**Figure 5-40. Hydric Soils – BW9, BW10, BW11, & BW12**



**Figure 5-41. Hydric Soils – BW13 and Movement Corridor**



**Figure 5-42. Hydric Soils – BW14**

## Prime Farmland Soils

### Proposed Action

Prime farmland soils found on BRSF are listed in [Table 5-25](#). Approximately 25 percent (50,267 acres) of forest soils are classed as prime farmland; Coldwater (TA-1) contains the greatest amount of prime farmland soils. [Figure 5-43](#) shows the distribution of prime farmland on BRSF.



**Table 5-25. BRSF Prime Farmland Soils**

Tactical Area (TA)	Acres <sup>1</sup>	Percent of TA
Coldwater (TA-1)	16,085	47
Sweetwater (TA-2)	7,295	20
Rock Creek (TA-3)	7,116	22
Horse Creek (TA-4)	2,887	25
West Boundary (TA-5)	5,352	33
Floridale (TA-6)	7,790	32
Bone Creek (TA-7)	1,626	10
Juniper Creek (TA-8)	2,116	9
Yellow River (TA-9)	0	0
<b>Total</b>	<b>50,267</b>	<b>—</b>

1. Total area does not include borrow pits, water, urban lands, Aquents, gullied lands, and other variants.

### **Subalternative 1 (Preferred Alternative)**

Prime farmland associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-44](#) through [Figure 5-48](#). LZs/DZs BW3, BW6, BW7, BW8, BW13, and approximately 16 acres of the Movement Corridor are located within prime farmland, as shown in the respective figures. These locations are currently used by the FFS for silvicultural purposes.



**Figure 5-44. Prime Farmland – BW2 & BW3**



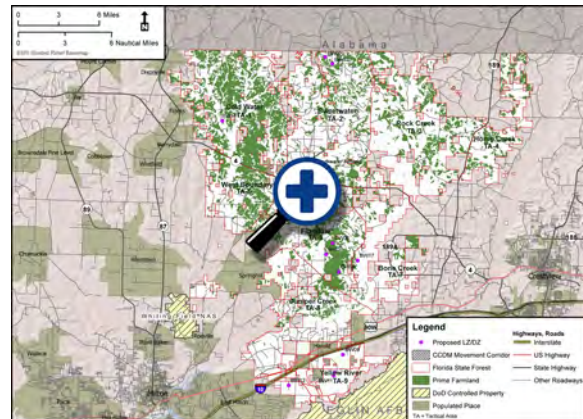
**Figure 5-45. Prime Farmland – BW6, BW7, BW8, & BW17**



**Figure 5-46. Prime Farmland – BW9, BW10, BW11, & BW12**



**Figure 5-47. Prime Farmland – BW13 and Movement Corridor**



**Figure 5-43. BRSF Prime Farmland**



Figure 5-48. Prime Farmland – BW14

## Soil Erosion

### Erodible Soils

#### Proposed Action

The highly erodible and potentially highly erodible soils found on BRSF are presented in [Table 5-26](#) and shown in [Figure 5-49](#). Approximately 112,755 acres (55 percent) of the BRSF is composed of highly erodible soils.

Generally, BRSF soils are considered very susceptible to soil erosion due to the dominance of sandy soil textures and extensive areas of moderately to steeply sloped topography.

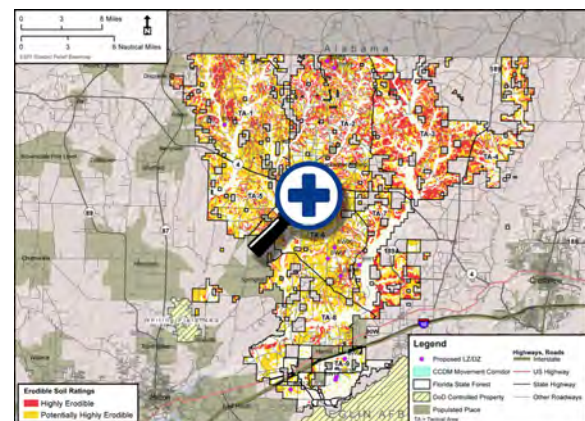


Figure 5-49. BRSF Highly Erodible and Potentially Highly Erodible Soils

Table 5-26. BRSF Erodible Soils

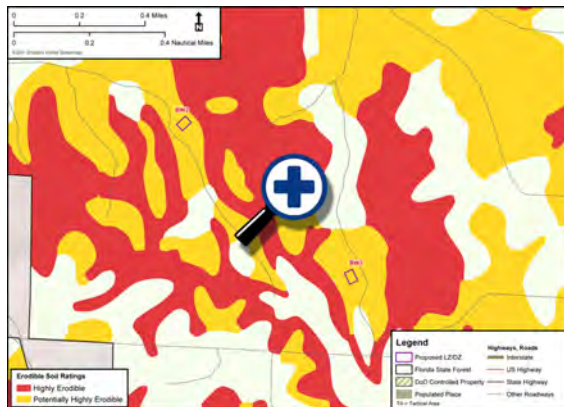
Tactical Area (TA)	Erodible Soils (acres)		Total Area <sup>1</sup>
	Highly Erodible	Potentially Highly Erodible	
Coldwater (TA-1)	7,304	14,361	21,665
Sweetwater (TA-2)	8,402	11,821	20,223
Rock Creek (TA-3)	11,387	7,890	19,277
Horse Creek (TA-4)	2,540	3,773	6,313
West Boundary (TA-5)	1,986	7,699	9,685
Floridale (TA-6)	2,981	11,936	14,917
Bone Creek (TA-7)	3,582	4,643	8,225
Juniper Creek (TA-8)	1,703	8,843	10,546
Yellow River (TA-9)	183	1,721	1,904
<b>Total</b>	<b>40,068</b>	<b>72,687</b>	<b>112,755</b>

1. Total area does not include pits, water, urban lands, Aqueducts, gullied lands, and other variants.

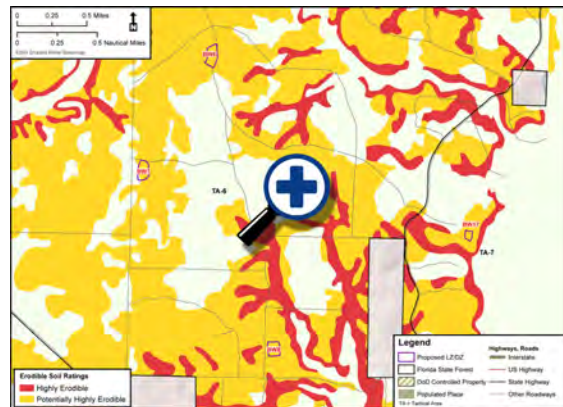


### Subalternative 1 (Preferred Alternative)

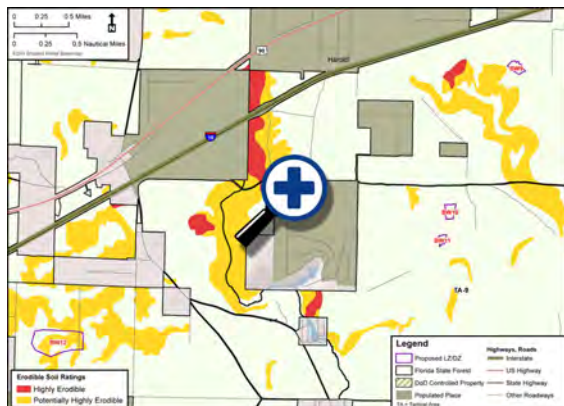
Erodible soils associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-50](#) through [Figure 5-54](#). LZs/DZs Blackwater Airfield, BW2, BW3, BW6, BW7, BW8, 12, BW13, BW14, BW17 and approximately 239 acres of the movement corridor are located in potentially highly erodible soils. LZ/DZ BW14 and approximately 15 acres of the movement corridor are located in highly erodible soils.



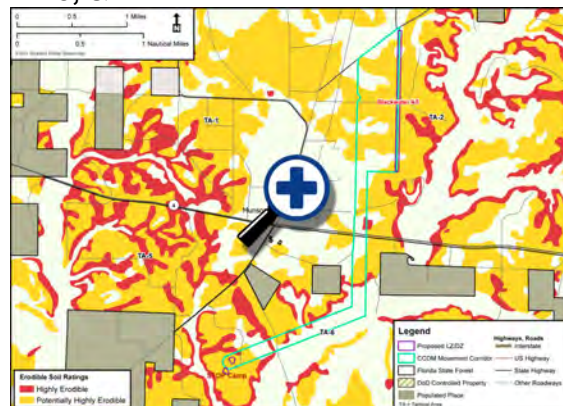
**Figure 5-50. Erodible Soils – BW2 & BW3**



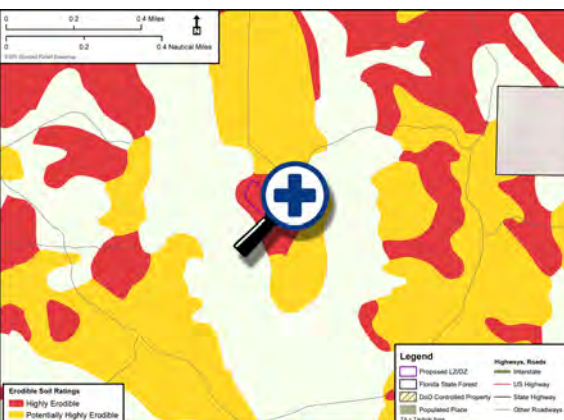
**Figure 5-51. Erodible Soils – BW6, BW7, BW8, & BW17**



**Figure 5-52. Erodible Soils – BW9, BW10, BW11, & BW12**



**Figure 5-53. Erodible Soils – BW13 and Movement Corridor**



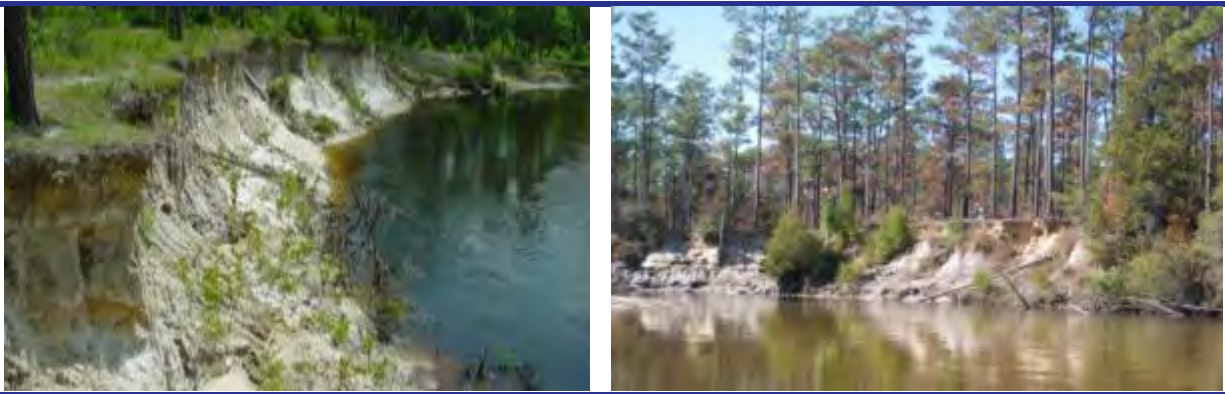
**Figure 5-54. Erodible Soils – BW14**

## Natural Soil Erosion Sources

### Streambanks

#### **Proposed Action / Subalternative 1 (Preferred Alternative)**

The affected environment for streambanks would be the same for both the Proposed Action and Subalternative 1. BRSF streambank habitats are generally divided into three categories: (1) banks with vegetation and leaf litter 2 to 10 feet high, (2) clay lens with vegetation, and (3) small sand banks with trailing grasses (Peters and Jones, 1973). A study conducted by the FDEP within the BRSF documented channel segments of the Blackwater River with severe erosion (Ray, 1999). In several instances, banks were observed to exhibit unstable overheightened and oversteepened conditions leading to mass slope failure (see Streambank Erosion photos). No site-specific BRSF streambank erosion data were available.



**Blackwater River Bendway Streambank Erosion** (Photos by Donald Ray)

### Steepheads

#### **Proposed Action**

The 11 steepheads within the BRSF are listed in [Table 5-27](#) and shown in [Figure 5-30](#). Eighty-two percent of BRSF steepheads are within the Juniper Creek tactical area (TA-8).

**Table 5-27. BRSF Steepheads**

Tactical Area (TA)	Number of Steepheads
Juniper Creek (TA-8)	9
Yellow River (TA-9)	2
<b>Total</b>	<b>11</b>

#### **Subalternative 1 (Preferred Alternative)**

Steepheads associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-24](#) through [Figure 5-28](#). There are no steepheads on or near the identified LZs/DZs or movement corridor.

## Accelerated Soil Erosion Sources

### Borrow Pits

#### Proposed Action

On BRSF, there are 46 borrow pits (ranging from less than an acre to several acres in size) classified as active, inactive (abandoned), or reclaimed ([Table 5-28](#) and [Figure 5-30](#)). Borrow pits are potential sources of severe soil erosion and sedimentation, due to their state of perpetual surface disturbance, bare surface conditions, common location in proximity to waterways, accumulations of loose soil materials, and exposure of relatively impervious soil layers (see photo of Sweetwater Borrow Pit-Induced Gully Erosion and Post-Reclamation Conditions). BRSF pits are stabilized and restored to native vegetation once mining operations have ceased (Hollie et al., 2010).

**Table 5-28. BRSF Borrow Pits**

Tactical Area (TA)	Borrow Pits (Number)			Total
	Active	Inactive	Reclaimed	
Coldwater (TA-1)	2	4	—	6
Sweetwater (TA-2)	2	8		10
Rock Creek (TA-3)	4	4	1	9
Horse Creek (TA-4)	—	3	—	3
West Boundary (TA-5)		3		3
Floridale (TA-6)		1	3	4
Bone Creek (TA-7)	3	1	1	5
Juniper Creek (TA-8)	2	3	—	5
Yellow River (TA-9)	1	—		1
<b>Total</b>	<b>6</b>	<b>27</b>	<b>0</b>	<b>46</b>



**BRSF Sweetwater Borrow Pit-Induced Gully Erosion and Post-Reclamation Conditions** (Photos by Donald Ray)

#### Subalternative 1 (Preferred Alternative)

Borrow pits associated with individual LZs/DZs and the movement corridor are shown in [Figure 5-24](#) through [Figure 5-28](#). There is one borrow pit located within the movement corridor, and one borrow pit located near LZ/DZ BW14 as shown in the respective figure.



### Unpaved Roads and Crossings

#### ***Proposed Action / Subalternative 1 (Preferred Alternative)***

The affected environment for unpaved roads and crossings would be the same for both the Proposed Action and Subalternative 1. On BRSF, unpaved roads are highly susceptible to soil erosion due to the geologic formations, soils, topography, and climate that characterize this forest and the type of maintenance performed on these unpaved roads (i.e., grading). Soils detached from roads and roadside areas are readily discharged into waterways at crossings (see photos of Unpaved Road Erosion and Wetland Sedimentation and Coon Camp Branch Low-Water Crossing-Induced Soil Erosion and Sedimentation). Studies by FDEP have confirmed that unpaved roads and crossings are primary sources of soil erosion and sedimentation in water resources on BRSF (Ray, 1996; Ray, 2005a; Ray, 2005b).



**BRSF Unpaved Road Erosion and Wetland Sedimentation** (Photos by Donald Ray)



**BRSF Coon Camp Branch Low Water Crossing-Induced Soil Erosion and Sedimentation** (Photos by Donald Ray)

Routine maintenance of primary, secondary, and some tertiary unpaved roads on BRSF is primarily conducted by the Santa Rosa and Okaloosa County road maintenance departments. Most improved roads are surfaced with clayey sand materials to improve surface cohesion and stability. Maintenance of these roads is conducted in compliance with the forest road standards described in the Road and Bridge Plan (FDACS, Division

of Forestry, Policies and Procedures 500.108) and silviculture BMPs manual (FDACS, 2008) developed by FDACS, Division of Forestry (FDACS, 2007).

Based on available data, most BRSF unpaved road water crossings are low water crossings (see [Table 5-29](#) and the photos of the Mare Branch Unpaved Tertiary Road Low Water Crossing). The BRSF is currently discriminating the locations of non-crossing road drains and crossing culverts therefore a complete culvert crossings dataset is not available. Low water crossings account for approximately 67 percent of unpaved road crossings. A summary of BRSF unpaved road bridge and low-water crossings is presented in [Table 5-29](#). In most cases, low water crossings are unimproved; however, based on the stream flow conditions and trafficking loads and frequency reinforcing, materials such as rock or geo-web materials may be required to reduce in-stream, streambank, and road approach disturbances. Between FY 2007–2008 and FY 2011–2012, 32 low water crossings were improved (FDACS, 2013).

**Table 5-29. BRSF Unpaved Road Crossings**

Tactical Area (TA)	Number of Crossings		Total
	Bridge	Low Water	
Coldwater (TA-1)	21	39	60
Sweetwater (TA-2)	14	18	32
Rock Creek (TA-3)	20	54	74
Horse Creek (TA-4)	7	7	14
West Boundary (TA-5)	3	31	34
Floridale (TA-6)	9	16	25
Bone Creek (TA-7)	11	5	16
Juniper Creek (TA-8)	8	17	25
Yellow River (TA-9)	0	0	0
<b>Total</b>	<b>93</b>	<b>187</b>	<b>280</b>



**BRSF Mare Branch Unpaved Tertiary Road Low Water Crossing**

(Photos by Donald Ray)

Temporary logging roads also occur on BRSF (see Clearcut Logging Road photo). These roads, which are not included on the roads inventory, are used to collect and remove harvested timber from the site. In most cases, these native-soil roads are not built to road class standards and are abandoned once harvesting operations cease.



Generally, these roads are restored via natural attenuation. Since these roads are not designed for continued use by wheeled-vehicles, they easily degrade and may be highly susceptible to soil erosion. In addition, firebreaks are also not designed to support continued use by motor vehicles.

## 5.6.2 Environmental Consequences

As discussed in Section [3.6](#), potential adverse impacts to earth resources may occur from use of wheeled vehicles and dismounted movement, aircraft and AO. Other proposed action effectors are not addressed in this section.

### 5.6.2.1 Land Disturbance

As discussed in Section [3.6.3](#), LZs/DZs, point impacts, consumption, and incidental land disturbance would have no adverse impact on soils. Impacts to BRSF earth resources identified in Section [5.6.1](#) would generally be the same as those described in Section [3.6](#).



**BRSF Clearcut Logging Road**

(Photo by Greg Kesler)

### *Proposed Action*

Because Blackwater Airfield is currently utilized for aircraft operations, it is anticipated that training conducted at this location would be adverse but insignificant, site specific, low intensity, and short term. No modifications to the existing airfield would be required to accommodate proposed aircraft mission activities. The proposed use of light military aircraft is not anticipated to exceed the surface loading and pressures associated with other aircraft that use the airfield.

Overall, impacts at LZs/DZs from land disturbance would likely be limited to minor disturbances of maintained areas that could be fully recovered during routine FFS activities and maintenance. No loss or degradation of prime farmland soils or geologic steephead or closed depression features is anticipated because there would be no other land disturbance activities.

### *Subalternative 1 (Preferred Alternative)*

Potential impacts would be the same as those described under the Proposed Action, with less potential for impact due to the reduced level of activity under Subalternative 1.

### 5.6.2.2 Ground Movement

### *Proposed Action*

As discussed in Section [3.6](#), ground movement has the potential for causing soil erosion; however, this potential is considered negligible given general operating

procedures identified in Section 2.5 and the Proposed Resource-Specific Mitigations identified in Section 3.6.4. Based on information provided in Section 3.6, BRSF temporary low- and moderate-use camp site suitability and limitation constraint areas are summarized in Table 5-30 and Figure 5-55. BRSF tactical area lands were rated as somewhat limited or very limited for bivouac suitability. Limitations would be less restrictive on sites for tents or remote camps. Areas identified as very limited would not be suitable for bivouacking.

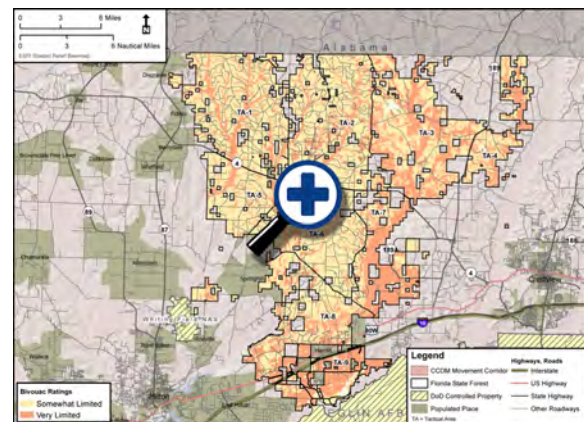
**Table 5-30. BRSF Bivouac Constraint Areas**

Tactical Area (TA)	Constraint Area (acres)		Total Area <sup>1</sup> (acres)
	Somewhat Limited	Very Limited	
Coldwater (TA-1)	26,804	7,635	34,439
Sweetwater (TA-2)	27,647	8,044	35,691
Rock Creek (TA-3)	17,460	15,279	32,739
Horse Creek (TA-4)	6,391	5,100	11,491
West Boundary (TA-5)	13,165	2,944	16,109
Floridale (TA-6)	19,803	4,462	24,265
Bone Creek (TA-7)	6,003	10,123	16,126
Juniper Creek (TA-8)	14,146	8,218	22,364
Yellow River (TA-9)	2,487	9,463	11,950
<b>Total</b>	<b>133,906</b>	<b>71,268</b>	<b>205,174</b>

1. Total area does not include pits, water, urban lands, Aqueuts, gullied lands, and other variants.

Constraint areas where mission impact-induced earth resource effects are most likely to occur include closed depressions, steepheads, and hydric and erodible soils. Steepheads and closed depressions represent locations where steep slopes and sustained wet soil conditions are sensitive to soil disturbances from troop movements. These would mostly likely occur during dismounted maneuvers. These areas are associated with LU-1 and LU-2 constraint categories as identified in Section 2.5.

As discussed in Section 3.6, no adverse impacts to off-road areas would occur from wheeled vehicles. Proposed use of unpaved roads and crossings could degrade and destabilize unpaved road soil or aggregate surfaces, which could increase soil erosion and sedimentation. However, the proposed mission frequency as identified in Chapter 2 would likely not exceed the carrying capacity of available unpaved roads or be greater than the current level of vehicle use. Vehicles traversing low-water crossings could destabilize road approach slopes and increase soil erosion. Generally, the potential sources of sediment are limited to the portions of the road in immediate contact with the water course and the distance of road slopes from the gradient crest to the stream. Driving through a stream also mobilizes streambed sediments.



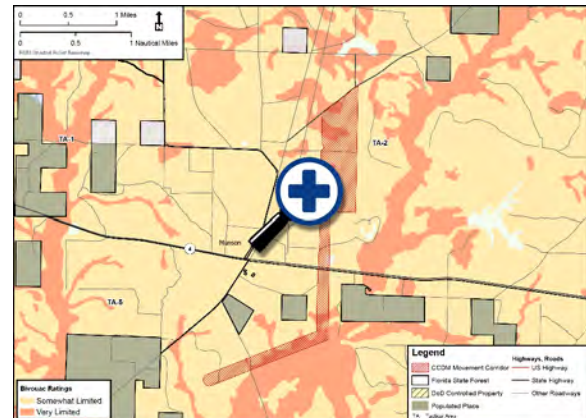
**Figure 5-55. BRSF Bivouac Constraint Areas**

However, implementation of General Operational Constraints identified in Section [2.5](#), along with implementation of Proposed Resource-Specific Mitigations in Section [3.6.4](#) would serve to minimize impacts to earth resources.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1 wheeled vehicle movement would have the same general impact as that described under the Proposed Action. However, impacts would likely be less versus the Proposed Action due to the reduced level of activity proposed under Subalternative 1.

Ground movement would be limited to immediate areas around LZs/DZs and in the movement corridor. [Figure 5-56](#) shows bivouac constraint areas within the movement corridor; approximately 377 acres would be classified as somewhat limited and 97 acres as very limited. However, under this alternative Bivouacking would not occur and therefore ground movement impacts would be limited to troops walking across the ground. Additionally, the borrow pit associated with the movement corridor and the borrow pit located near LZ/DZ BW14 would be avoided per Resource-Specific Mitigations in Section [3.6.4](#). Ground movement would not be expected to affect the utility prime farmland areas located in the movement corridor – these areas are used for FFS silvicultural activities.



**Figure 5-56. Movement Corridor Bivouac Constraint Areas**

Subalternative 1 would still require implementation of General Operational Constraints identified in Section [2.5](#), along with implementation of Proposed Resource-Specific Mitigations in Section [3.6.4](#) would serve to minimize impacts to earth resources.

### **5.6.2.3 Aircraft Operations**

#### ***Proposed Action***

The proposed BRSF aircraft operations detailed below include LZ/DZ landings use. LZ/DZ landings may occur within LU-1 and LU-2 areas. All activities must adhere to noted general and Proposed Resource-Specific Constraints and mitigations identified in Sections [3.6.4](#), respectively.

Because Blackwater Airfield is currently utilized for aircraft operations, it is anticipated that training conducted at this location would result in neutral, fully reversible impacts. No modifications to the existing airfield would likely be required to accommodate proposed aircraft mission activities. Impacts would likely be limited to minor disturbances of maintained areas that could be fully recovered during routine FFS maintenance. The proposed use of light military aircraft is not anticipated to exceed the surface loading and pressures associated with other aircraft that use the airfield.

Furthermore, no loss or degradation of prime farmland soils or geologic steephead or closed depression features is anticipated.

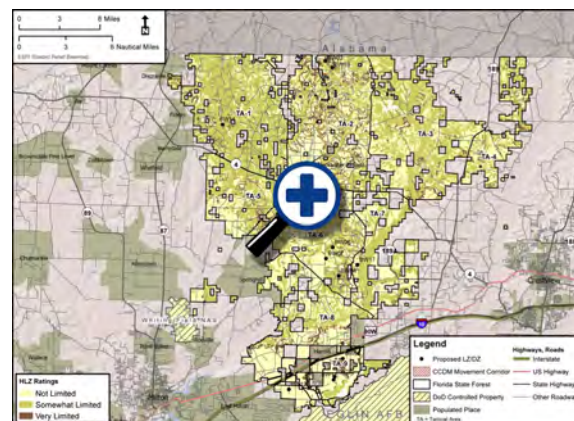
Proposed use of other LZ/DZ-based aircraft landing activities include A/LVL and LLHI/E training at existing cleared areas, primarily clearcuts, in various locations at BRSF (see Section 2.3.2.1). All forest tactical areas are candidate locations. No landing strips, helicopter pads, or other construction activities would be required to prepare selected sites. For safety and operational reasons, aircraft landings would take place on relatively level ground that is less prone to unstable soil conditions and soil erosion than steeper sites.

Based on analyses presented in Section 3.6, BRSF LZ suitability and limitation constraint areas are summarized in Table 5-31 and Figure 5-57. Very limited areas fall under the LU-1 category and would be limited in use for LZs/DZs.

**Table 5-31. BRSF Landing Zone Constraint Areas**

Tactical Area (TA)	Constraint Area (acres)			Total Area <sup>1</sup> (acres)
	Not Limited	Somewhat Limited	Very Limited	
Coldwater (TA-1)	8,251	24,526	1,662	34,439
Sweetwater (TA-2)	18,004	12,760	4,927	35,691
Rock Creek (TA-3)	11,875	19,462	1,402	32,739
Horse Creek (TA-4)	4,786	5,665	1,040	11,491
West Boundary (TA-5)	7,047	8,341	721	16,109
Floridale (TA-6)	11,452	10,947	1,866	24,265
Bone Creek (TA-7)	7,740	7,779	607	16,126
Juniper Creek (TA-8)	14,792	6,461	1,111	22,364
Yellow River (TA-9)	9,048	1,874	1,028	11,950
<b>Total</b>	<b>92,995</b>	<b>97,815</b>	<b>14,364</b>	<b>205,174</b>

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.



**Figure 5-57. BRSF Landing Zone Constraint Areas**

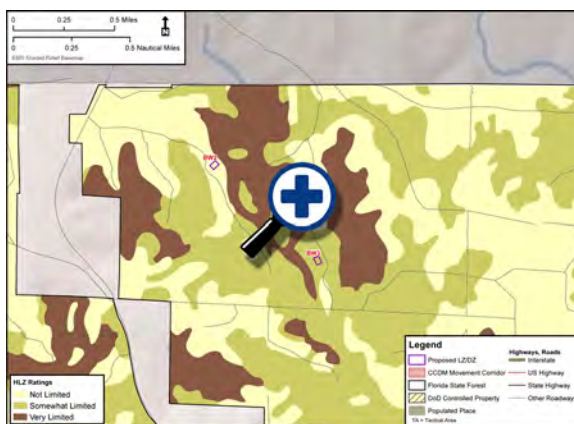
Again, with the implementation of mitigations specific to earth resources (see Section 3.6.4), potential soil erosion, compaction, and rutting impacts from proposed LZ/DZ use at BRSF are anticipated to be adverse but insignificant, site specific, low intensity, and short term. No loss or degradation of prime farmland, karst soils, geologic steephead, or closed depression features is anticipated. Since no hydric soils were



identified within the estimated footprint area, federal or state wetland permits are not likely required.

### ***Subalternative 1 (Preferred Alternative)***

Impacts would be similar to those described under the Proposed Action, although on a lesser scale due to the reduced level of proposed activity. LZ/DZ constraint areas associated with individual LZs/DZs are shown in [Figure 5-58](#) through [Figure 5-62](#). Only a small corner of BW14 is classified as very limited, while LZs/DZs BW03, BW06, BW08, and BW13 are in areas classified as somewhat limited, which are associated with the LU-2 constraint classification; these soils have features that are moderately favorable for the specified use. Limitations can be overcome or minimized by implementation of the constraints identified in [Section 2.5](#) associated with LU-2 areas.



**Figure 5-58. LZ/DZ Constraint Areas – BW2 & BW3**



**Figure 5-59. LZ/DZ Constraint Areas – BW6, BW7, BW8, & BW17**



**Figure 5-60. LZ/DZ Constraint Areas – BW9, BW10, BW11, & BW12**



**Figure 5-61. LZ/DZ Constraint Areas – BW13**





Figure 5-62. LZ/DZ Constraint Areas – BW14

#### 5.6.2.4 Amphibious Operations

##### *Proposed Action*

Boat and troop egress and ingress activities would occur along the banks and shorelines of available training areas within all use areas (except prohibited areas and RAs), with noted General Operational Constraints and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [3.6.4](#), respectively. As discussed in Section [3.6](#), AO could disturb soils and trample vegetation, resulting in conditions that may result in accelerated bank erosion.

As discussed in Section [5.6.1.2](#), some reaches of larger BRSF streams are experiencing scouring and mass failures from overheightened and oversteepened bank conditions. These features are most common along river bendways and are particularly sensitive to disturbance. These conditions are likely most common water bodies such as the Blackwater River. AO conducted in these sensitive locations or other water areas with similar conditions could further destabilize streambanks and significantly increase soil loss and streambank retreat.

On streambanks and shorelines with established vegetation and stable grades (not overheightened or oversteepened), impacts would consist of minor disturbances that, in most cases, would naturally recover. Operations conducted at boat launches would not likely increase streambank degradation or soil loss.

Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations, such as rotation of ingress/egress locations, would serve to minimize impacts to earth.

##### *Subalternative 1 (Preferred Alternative)*

Under Subalternative 1 this activity would not occur; therefore there would be no impact.

#### 5.6.3 Earth Resources Impact Summary

[Table 3-31](#) describes the context, intensity, and duration factors utilized in analysis for impacts to earth resources; based on these factors the Air Force has identified some insignificant impacts to the natural environment. In summary, there are unavoidable

adverse impacts associated with minor soil erosion impacts resulting from LZ/DZ use, ground movement, and AO. No NPDES permitting requirements have been identified. The intensity of these impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section 2.5 and 3.6.4, respectively.

Table 5-32 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-32. Proposed Action/Subalternative 1 Earth Resource Impacts Summary – BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Vehicle use at water crossings could increase soil erosion and mobilization of streambed sediments. Additionally, soil/water contamination could result from fuels and other materials on roadways and in parking areas. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> Same as Proposed Action, with the potential for impact being less associated with the reduced level of proposed activity.								
Dismounted movement	<b>Proposed Action:</b> Negligible, short-term potential for soil compaction and accelerated soil erosion associated with trampling and incidental surface disturbance. Impacted areas would be expected to naturally recover. <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative, as well as the limited locations associated with ground movement.								
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> Potential for soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff activities and refueling activities. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> Same as Proposed Action, with potential for impacts being site specific and less possible due to the reduced level of proposed activity.								
Amphibious Operations	<b>Proposed Action:</b> Operations could further destabilize streambanks in some reaches of larger BRSF streams (e.g., Blackwater River) with existing overheightened and oversteepened bank conditions, resulting in increased soil loss and streambank retreat. In streams with established vegetation and stable banks, minor disturbances would be expected to naturally recover. Operations at boat launches should not have any adverse effects. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.								
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative.								

GBS = ground burst simulator; ISD = incidental surface disturbance

### 5.6.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for earth resources have been identified as a result of analyses in this chapter. All General Operational Constraints (Section [2.5](#)) and Proposed Resource-Specific Mitigations (Section [3.6.4](#)) identified previously would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no impact (green).

## 5.7 WATER RESOURCES

### 5.7.1 Affected Environment

Water resources at BRSF include the watersheds of the Blackwater River and its tributaries, the sand and gravel and Floridan aquifers, and areas of wetlands and floodplains associated with the Blackwater River and its tributaries.

#### 5.7.1.1 Surface Waters

##### *Proposed Action*

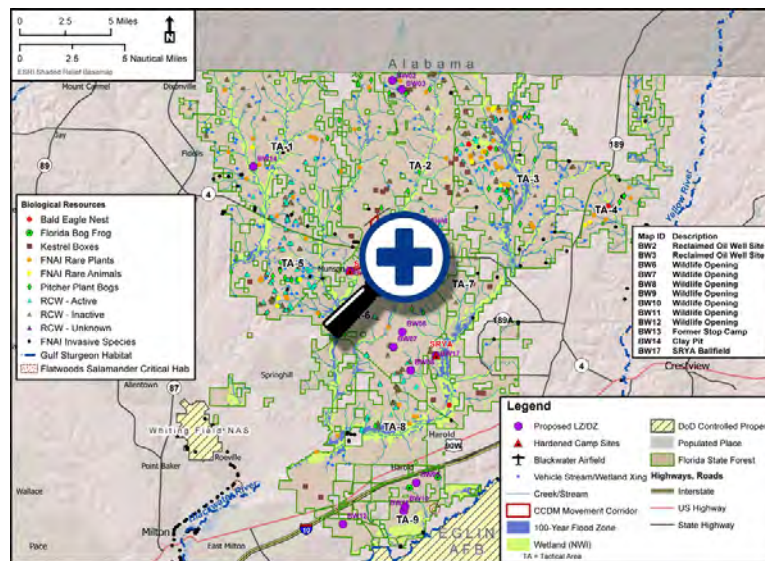
The Blackwater River is the primary surface water feature in BRSF. The Blackwater River watershed is fed by three major tributaries: Juniper Creek, Coldwater Creek, and Sweetwater Creek (FDEP, 2004). The Blackwater River flows south into Blackwater Bay and the Gulf of Mexico. The Blackwater River watershed is one of the last natural shifting white-sand bottom river systems in the world. FDEP classifies the Blackwater River within BRSF as an OFW because of its high ecological integrity and recreation potential. Despite its OFW status, several streams within the Blackwater River watershed do not meet their designated use and are listed as impaired by FDEP. [Table 5-33](#) lists impaired waters within the Blackwater River watershed and the impairment classification for each listed stream. [Figure 5-63](#) provides an overview of surface water resources at BRSF. [Figure 5-64](#) through [Figure 5-72](#) provide more detailed views of surface water resources in each TA at BRSF.

**Table 5-33. Impaired Waters in BRSF**

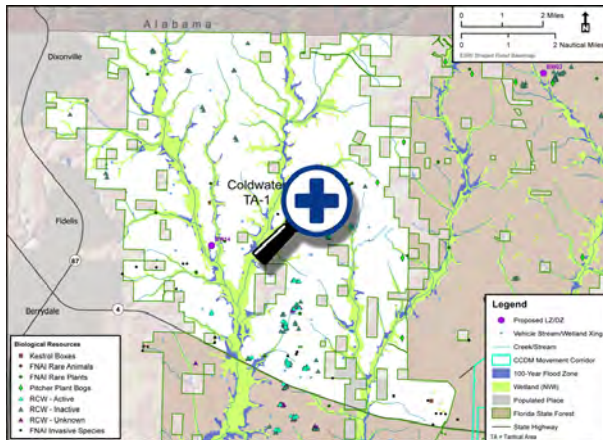
Group Name	Receiving Body of Water	Impaired Classification
Pensacola <sup>1</sup>	Blackwater River	Verified impaired due to fish consumption advisory.
	Yellow River	Verified impaired due to mercury in fish and chloroform.
	Mare Creek	Potentially impaired due to low dissolved oxygen and increase turbidity.
	East Fork	Potentially impaired due to evidence of chloroforms and total suspended solids.
	Big Juniper Creek	Potentially impaired due to evidence of chloroforms and increases turbidity.
	Big Coldwater Creek	Potentially impaired due to evidence of chloroforms and total suspended solids.
	Little Withlocooche River	Potentially impaired due to evidence of dissolved oxygen and chloroforms.

1. Classified as 303d impaired waters.

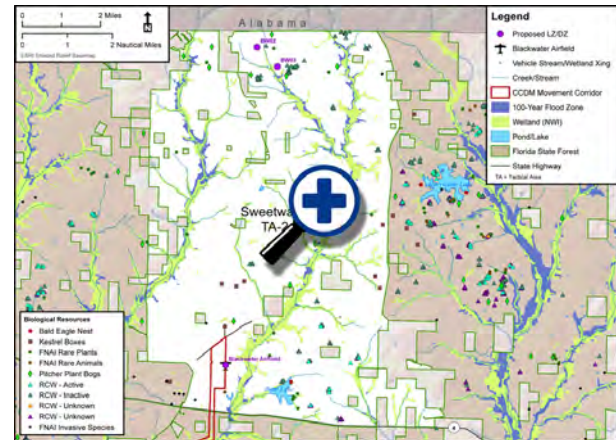




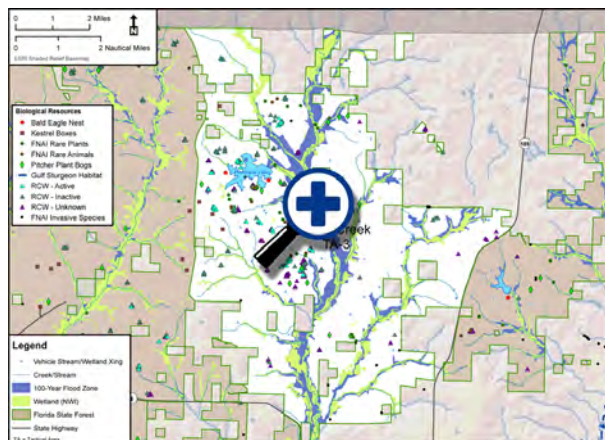
**Figure 5-63. Water and Biological Resources at BRSF – Overview**



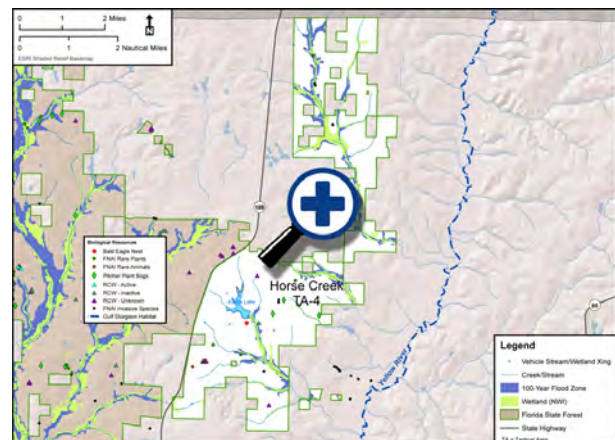
**Figure 5-64. Water and Biological Resources – TA-1 at BRSF**



**Figure 5-65. Water and Biological Resources – TA-2 at BRSF**

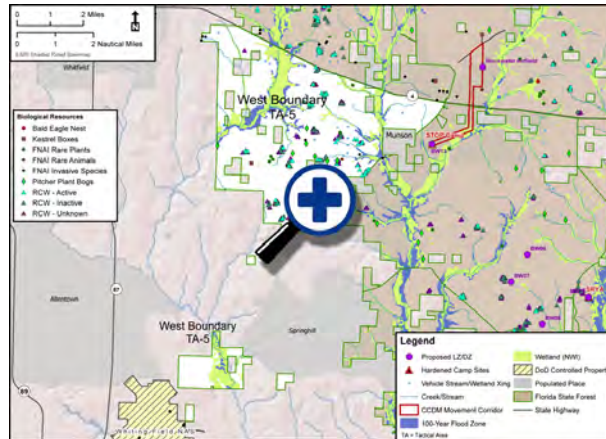


**Figure 5-66. Water and Biological Resources – TA-3 at BRSF**

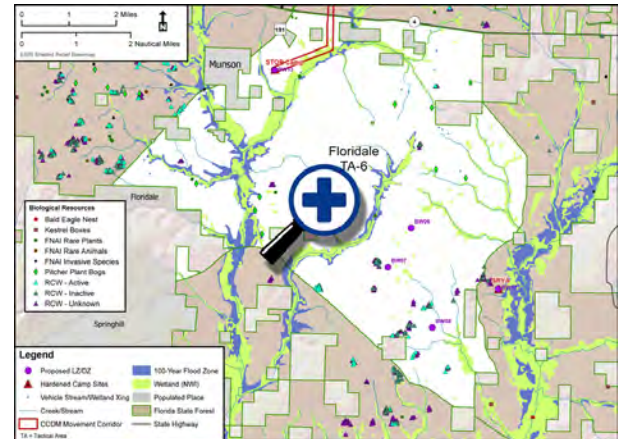


**Figure 5-67. Water and Biological Resources – TA-4 at BRSF**

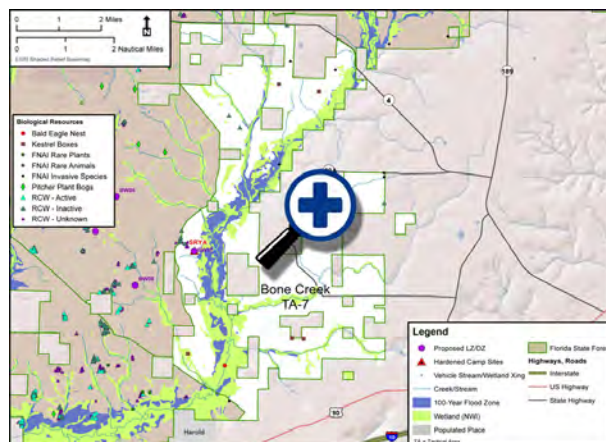




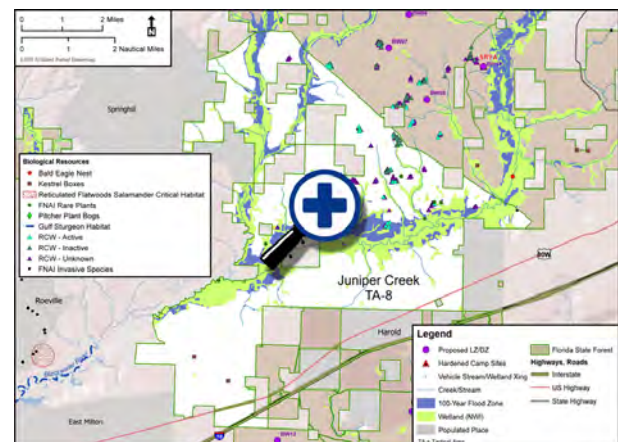
**Figure 5-68. Water and Biological Resources – TA-5 at BRSF**



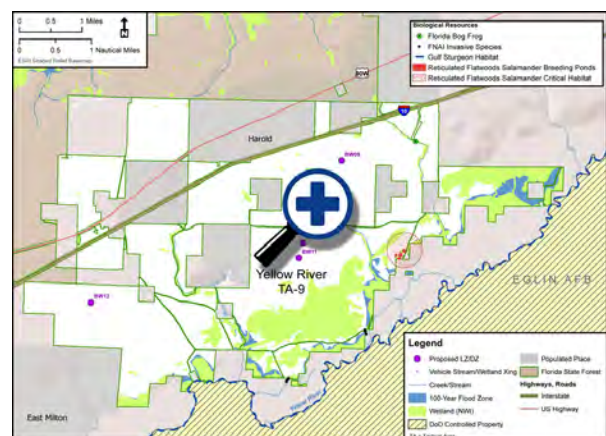
**Figure 5-69. Water and Biological Resources – TA-6 at BRSF**



**Figure 5-70. Water and Biological Resources – TA-7 at BRSF**



**Figure 5-71. Water and Biological Resources – TA-8 at BRSF**

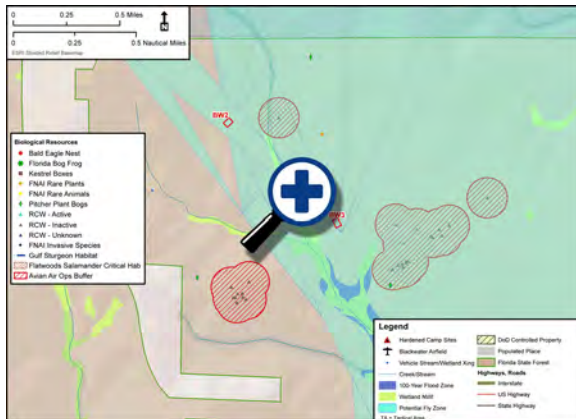


**Figure 5-72. Water and Biological Resources – TA-9 at BRSF**

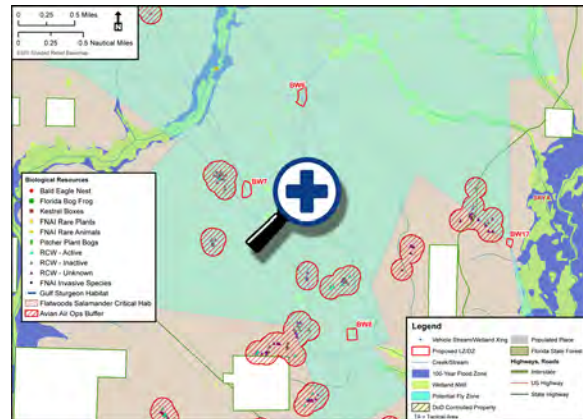


### Subalternative 1 (Preferred Alternative)

Figure 5-73 through Figure 5-77 show the surface water resources associated with the proposed Subalternative 1 LZs/DZs and the movement corridor; there are no surface waters associated with the LZs/DZs or movement corridor.



**Figure 5-73. BRSF Water and Biological Resources – BW2 & BW3**



**Figure 5-74. BRSF Water and Biological Resources – BW6, BW7, BW8, BW17**



**Figure 5-75. BRSF Water and Biological Resources – BW9, BW10, BW11, BW12**



**Figure 5-76. BRSF Water and Biological Resources – BW13 and Movement Corridor**



**Figure 5-77. BRSF Water and Biological Resources – BW14**

### 5.7.1.2 Wetlands

#### *Proposed Action*

Wetlands at BRSF are closely associated with stream channels in the area. There are 27,222 acres of wetlands at BRSF, including nearly 26,414 acres of palustrine or freshwater wetlands, 495 acres of lacustrine wetlands, and 313 acres of riverine wetlands ([Table 5-34](#)). Palustrine or freshwater wetlands include forested wetlands, scrub-shrub wetlands, emergent wetlands, and ponds. Lacustrine wetlands include deepwater habitat (depths greater than 6.6 feet) associated with lakes. Riverine wetlands occur entirely within stream channels of nontidal, low-gradient, perennial streams (Cowardin et al., 1979). [Figure 5-63](#) provides an overview of wetlands at BRSF. [Figure 5-64](#) through [Figure 5-72](#) provide more detailed views of the distribution of wetlands in each TA at BRSF.

**Table 5-34. Wetlands Summary for BRSF (acres)**

Wetland Type	Wetland Subtype	Tactical Area									Total
		1	2	3	4	5	6	7	8	9	
Palustrine	Forest	5,153	3,544	3,404	820	1,743	2,228	2,856	4,142	2,044	25,934
	Scrub-Shrub	71	7	43	7	21	5	24		97	275
	Emergent	5	16	7	8	27	16	35	13	16	143
	Ponds	10	13	2	2	1	2	24	5	3	62
<b>Subtotal</b>		<b>5,239</b>	<b>3,580</b>	<b>3,456</b>	<b>837</b>	<b>1,792</b>	<b>2,251</b>	<b>2,939</b>	<b>4,161</b>	<b>2,160</b>	<b>26,414</b>
Riverine	Instream	9		17		54	8	123	102		313
Lacustrine	Lakes		110	325	60						495
<b>Grand total</b>		<b>5,249</b>	<b>3,690</b>	<b>3,798</b>	<b>897</b>	<b>1,846</b>	<b>2,259</b>	<b>3,062</b>	<b>4,262</b>	<b>2,160</b>	<b>27,222</b>

#### *Subalternative 1 (Preferred Alternative)*

[Figure 5-73](#) through [Figure 5-77](#) show the wetlands associated with the proposed LZs/DZs and the movement corridor. None of the proposed LZs/DZs are within wetland areas. Approximately 47 acres of the movement corridor consist of wetlands – mainly associated with the hydric soil areas as discussed in Section 5.6.

### 5.7.1.3 Floodplains

#### *Proposed Action*

Floodplains at BRSF are closely associated with stream channels and wetlands within the Blackwater River watershed, although floodplains are not as extensively distributed as wetlands. In all, 29,348 acres of floodplains have been mapped at BRSF ([Table 5-35](#)). [Figure 5-63](#) provides an overview of floodplains at BRSF. [Figure 5-64](#) through [Figure 5-72](#) provide more detailed views of floodplains in each TA at BRSF.

**Table 5-35. Floodplain Summary for BRSF (acres)**

Tactical Area									
1	2	3	4	5	6	7	8	9	Total
4,869	3,258	5,718	1,349	2,062	2,546	3,210	5,344	992	29,348

### ***Subalternative 1 (Preferred Alternative)***

[Figure 5-73](#) through [Figure 5-77](#) show the floodplains associated with the proposed LZs/DZs and the movement corridor. Approximately 0.15 acres of LZ/DZ BW14 is within 100-year floodplain area; none of the other proposed LZs/DZs are within floodplain areas. Approximately 3 acres of the movement corridor consist of floodplain.

## **5.7.2 Environmental Consequences**

As discussed in Section [3.7](#), potential adverse impacts to water resources may occur from use of wheeled vehicles and dismounted maneuvers, and AO. Other Proposed Action effectors are not addressed in this subsection. Impacts to BRSF water resources identified in Section [5.7.1](#) would generally be the same as those described in Section [3.7](#).

Impact assessment considers implementation of the General Operational Constraints inherent to the Proposed Action as identified in Section [2.5](#). These constraints, such as establishment of buffers around sensitive water resource locations and habitats, would minimize potentially adverse impacts and, in some cases, preclude adverse impacts altogether. Avoidance areas for water resources are identified in [Figure 5-1](#) through [Figure 5-10](#).

### **5.7.2.1 Water Resource Protection Levels**

Water resource protection levels were defined based on current environmental management requirements at Eglin AFB (EAFBI 13-212; U.S. Air Force, 2012). Water resources fall within the LU-1 protection level as described in Section [5.1](#), shown in [Figure 5-1](#) through [Figure 5-10](#) as yellow. The LU-1 protection level would affect all surface water bodies (streams, ponds, and lakes), wetlands, and floodplains and require a 100-foot buffer zone around these resources. No land disturbance would be permitted outside of previously disturbed roadbeds and road shoulders. Dismounted maneuvers and AO would be allowed, but concentrated troop movements would not be allowed on steep slopes, streambanks/shorelines, and wetlands. Pyrotechnic use outside of hardened campsites located at the SRYA and STOP would be limited only to smoke grenades.

Wheeled vehicle use would be restricted to existing, approved roads and trails in each tactical area. [Table 5-36](#) summarizes the types and conditions of stream and wetland crossings at each TA at BRSF. Wheeled vehicle use of stream and wetland crossings would be restricted to crossings with a good or fair rating, and in coordination with the FFS. Vehicle access would be prohibited at stream and wetland crossings rated in poor condition. Currently at BRSF, 115 stream crossings and 41 wetland crossings are rated good or fair ratings, and 45 stream crossings and 35 wetland crossings are rated poor. Stream and wetland crossings at BRSF, and their relative conditions, are shown in [Figure 5-1](#) through [Figure 5-10](#). Good/fair crossings are shown in light blue, while poor condition crossings are identified by dark blue.

**Table 5-36. Stream/Wetland Road Crossing Condition Summary, BRSF**

Water Resource	Crossing Condition	Tactical Area									Total
		1	2	3	4	5	6	7	8	9	
Streams	Good	6	10	6	1	6	0	0	3	0	32
	Fair	16	11	20	4	12	4	5	11	0	83
	Poor	2	3	27	3	0	5	0	5	0	45
<b>Streams Subtotal</b>		<b>24</b>	<b>24</b>	<b>53</b>	<b>8</b>	<b>18</b>	<b>9</b>	<b>5</b>	<b>19</b>	<b>0</b>	<b>160</b>
Wetlands	Good	0	0	1	0	2	0	0	1	0	4
	Fair	9	1	3	0	13	5	0	6	0	37
	Poor	16	2	5	1	6	4	1	0	0	35
<b>Wetlands Subtotal</b>		<b>25</b>	<b>3</b>	<b>9</b>	<b>1</b>	<b>21</b>	<b>9</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>76</b>
<b>Grand Total</b>		<b>49</b>	<b>27</b>	<b>62</b>	<b>9</b>	<b>39</b>	<b>18</b>	<b>6</b>	<b>26</b>	<b>0</b>	<b>236</b>

Restrictions under the LU-1 protection level would prevent any surface disturbance on a total of 50,580 acres or 24.65 percent of BRSF (see [Table 5-37](#)). These restrictions in each TA range from 2,516 acres to 8,891 acres (19.19 percent to 32.60 percent of each TA). [Figure 5-1](#) through [Figure 5-10](#) provide more detailed views of water resource avoidance areas in each TA at BRSF. LU-1 areas are identified in each figure as solid yellow.

**Table 5-37. Water Resource Protection Level Summary, BRSF**

Protection Level	Tactical Area									Total
	1	2	3	4	5	6	7	8	9	
<b>Limited Use-1 (LU-1) (acres)</b>	<b>8,891</b>	<b>6,850</b>	<b>8,743</b>	<b>2,516</b>	<b>3,457</b>	<b>4,532</b>	<b>5,258</b>	<b>7,273</b>	<b>3,060</b>	<b>50,580</b>
<b>% Area Affected</b>	<b>25.81</b>	<b>19.19</b>	<b>26.70</b>	<b>21.89</b>	<b>21.46</b>	<b>18.68</b>	<b>32.60</b>	<b>32.52</b>	<b>25.61</b>	<b>24.65</b>

### 5.7.2.2 Ground Movement

#### *Proposed Action*

Ground movement activities that could affect water resources at BRSF include wheeled vehicle use and CCDM.

#### **Wheeled Vehicle Use**

Wheeled vehicle use would not directly affect surface water resources, since vehicles would not be allowed direct access to any surface waters or wetlands under the LU-1 protection level. Vehicle use would be restricted to existing roads and trails and approved, existing crossing locations in streams and wetlands.

Wheeled vehicle activities could indirectly affect water resources at BRSF. Routine use of the existing dirt road network at BRSF that extends throughout the TAs is a regular contributor to roadway erosion, and a recognized problem affecting some streams and wetlands (FDOF, 2000). Leaks of fuel and other vehicle fluids would also be a potential indirect source of contamination to water resources as described under land improvement effects. Some indirect effects to water resources from roadway erosion are likely and assumed to occur. While the potential for these occurrences are inherent to vehicle use (whether for the military, the FFS, or civilians) and unavoidable, implementation of standard vehicle maintenance and spill prevention SOPs would minimize the potential to a negligible level.

### **Dismounted Movements**

Dismounted troop movement is a potential impact to surface water and wetland resources in all TAs at BRSF. Potential effects would be direct but on a minor scale. Rotation of any stream or water body ingress/egress areas would serve to minimize the potential for any medium- to long-term impacts associated with shoreline erosion, and units would be advised to avoid any noticeably eroded shorelines. Over the short term, sediments in the fast-flowing streams typical of those found at BRSF would settle rapidly and water clarity would return, causing the streams to return to their former state once units had moved on.

### **Subalternative 1 (Preferred Alternative)**

Impacts would generally be the same as described under the Proposed Action, with less potential for impact associated with the reduced level of activity and the fact that none of the proposed LZs/DZs are located within surface waters or wetlands, and only one LZ/DZ contains a small portion of floodplain. The movement corridor does not contain any surface waters, and therefore there would be no associated impacts. While there are approximately 47 acres of wetlands within the movement corridor this is less than one-tenth of one percent of the total amount of wetlands on BRSF. Wetlands are considered as an LU-1 category for purposes of resources protection, as described in Section [2.5](#); while troop movements in LU-1 areas are allowed, concentrated troop movements are limited. Consequently, provided LU-1 constraints are implemented the potential for adverse impacts can be minimized.

### **5.7.2.3 Amphibious Operations**

#### **Proposed Action**

As discussed in Section [3.7](#), AO may potentially result in disturbance of streambeds and shorelines from the loading and unloading of watercraft and movement of watercraft on the surface waters, as well as ingress/egress of troops over the land/water interface as detailed in the *Riverine/Estuarine Programmatic Environmental Assessment* (U.S. Air Force, 2004). AO would adhere to the General Operational Constraints and mitigations identified in Section [2.5](#) associated with EAFBI 13-212, Section 7.2.9. Impacts to water resources would be minimized to levels less than significant by limiting activity to designated landing zones and by rotating landing zones when these areas show signs of erosion. There is potential for release of fuel from watercraft to surface waters, however, this potential is inherent to watercraft use (whether military or civilian). Such potential for adverse impacts would be minimized to a negligible level by implementation of SOPs for watercraft maintenance and spill prevention procedures as identified in Section [3.12](#). Motorized boats would be prohibited in Bear Lake.

#### **Subalternative 1 (Preferred Alternative)**

Under Subalternative 1 there would be no amphibious operations; thus there would be no associated impacts.



### 5.7.3 Water Resources Impact Summary

[Table 3-35](#) describes the context, intensity, and duration factors utilized in analysis for impacts to water resources; based on these factors the Air Force has identified insignificant impacts to the natural environment. However, potential impacts to water quality would not adversely affect public health or safety. In summary, unavoidable, direct adverse impacts to wetlands from ISDs are associated with ground movement and AO. The intensity of any of the identified impacts would be minimized through General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section [2.5](#) and [3.7.4](#), respectively. No USACE Section 404 permitting requirements have been identified.

[Table 5-38](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-38. Proposed Action/Subalternative 1 Surface Water, Wetland, and Floodplain Impacts Summary – BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section <a href="#">3.7</a> ). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity. Consumption would not occur under this alternative.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> Floodplains would not be affected. However, while wheeled vehicles would be required to utilize existing and approved roadways and water and wetland crossings, unavoidable adverse but not significant impacts to surface waters and wetlands may occur from use of wheeled vehicles at water/wetland crossings. Minor impacts may be associated with indirect impacts from vehicles (oil drips, etc.). Mitigations to prevent environmental damage as described in Section <a href="#">5.7.2.3</a> include use of only stream crossings rated “good” or “fair” for training exercises and avoiding use of crossings rated “poor.” Leaks of vehicle fluids would be mitigated through proper vehicle maintenance and spill kits for field use. Implementation of these mitigations and constraints would reduce impact potentials from “yellow” to “green” by decreasing the potential for vehicle interaction with degraded resources and the potential for any spills to occur. <b>Subalternative 1:</b> Impacts would generally be the same as the Proposed Action, with the potential for impacts reduced associated with the reduced level of activity under Subalternative 1.								
Dismounted movement	<b>Proposed Action:</b> Floodplains would not be affected. There is a potential for insignificant localized disturbance to shoreline and wetland vegetation (e.g., trampling) from personnel. This would be minor in nature and recoverable over the short term. Implementation of general and activity-specific operational constraints and mitigations as described in Section <a href="#">2.5</a> (such as frequently rotating tactical area use and minimizing unit size) would reduce adverse impacts from “yellow” to “green” by minimizing the potential for excessive trampling and allowing natural recovery processes. <b>Subalternative 1:</b> Impacts would generally be the same as the Proposed Action, with the potential for impacts reduced associated with the reduced level of activity under Subalternative 1. Impacts would be limited to LZs/DZs and the movement corridor.								

**Table 5-38. Proposed Action/Subalternative 1 Surface Water, Wetland, and Floodplain Impacts Summary – BRSF, Cont'd**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.								
Amphibious Operations	<b>Proposed Action:</b> Floodplains would not be affected. Boat landings and nearshore activities would potentially result in shoreline erosion in streams and rivers. Activities in estuarine areas could affect wetlands, as could water-land transition actions. These impacts would be adverse but not significant, because they would be localized and recoverable over the short term via natural processes. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.5 (such as using only designated ingress/egress points and rotating water/land transition areas) would reduce adverse impacts from “yellow” to “green” by minimizing the potential for erosion to occur allowing natural recovery processes. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impacts								
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.								

DZ = drop zone; GBS = ground burst simulator; LZ = landing zone

#### 5.7.4 Proposed Resource-Specific Mitigations

The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measure: avoidance of “Good” and “Poor” rated vehicle water crossings for training use in order to protect the better crossing sites and minimize further degradation of the sites in poor condition.

No additional Resource-Specific Mitigations for water resources have been identified. All General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations (Section 3.7.4) identified previously would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 5.8 BIOLOGICAL RESOURCES

### 5.8.1 Affected Environment

Figure 5-63 provides an overview of biological resources at BRSF. Figure 5-64 through Figure 5-72 provide more detailed views of biological resources in each TA at BRSF. Figure 5-73 through Figure 5-77 identify more detailed views of biological resources relative to the proposed LZ/DZ sites under Subalternative 1.

### 5.8.1.1 Vegetation

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

In combination with the Conecuh National Forest, BRSF is home of the largest contiguous longleaf pine/wiregrass ecosystem in the world and contains some of the richest plant and animal diversity. In 2006, FNAI completed an inventory and ecological community mapping project on 190,639 acres of BRSF. Types of vegetation found consist of mostly upland pine (approximately 70 percent of the land surveyed). The next largest ecological communities found are alluvial forest (approximately 14 percent) and sandhill (approximately 10 percent). Other types of vegetation include seepage slope, baygall, upland hardwood forest, mesic flatwoods, blackwater stream, floodplain swamp, dome swamp, depression marsh, and seepage slope (FDACS, 2013). [Table 5-39](#) lists representative vegetation species within each ecological community. More detailed descriptions of vegetation can be found in the *Guide to the Natural Communities of Florida* (FNAI, 2010).

**Table 5-39. Ecological Communities Within BRSF**

Vegetation Type	Description
Upland pine	Exists on high, rolling clay hills and consists of widely spaced trees with few shrubs and a dense cover of herbs often intergrading with sandhill. The dominant canopy tree is longleaf pine with scattered southern red oak and blackjack oak. Other species include shrubs such as dwarf huckleberry ( <i>Gaylussacia dumosa</i> ), gallberry, winged sumac, and Darrow's blueberry. Herbs are dense and dominated by wiregrass. Frequent low-intensity ground fires during the growing season reduce hardwood competition and facilitate pine and wiregrass reproduction.
Alluvial forest	Forms borders along the high sandy banks with a gradual transition to baygall as elevation increases. Alluvial forest mainly consists of Atlantic white cedar with slash pine and/or loblolly pine ( <i>Pinus taeda</i> ). Other plant species include red maple, sweetbay ( <i>Magnolia virginiana</i> ), tuliptree ( <i>Liriodendron tulipifera</i> ), black titi ( <i>Cliftonia monophylla</i> ), dahoon ( <i>Ilex cassine</i> ), American holly ( <i>Ilex opaca</i> ), swamp laurel oak ( <i>Quercus laurifolia</i> ), water oak ( <i>Quercus nigra</i> ), sourwood, and swamp bay. Short shrub species include coastal sweet pepperbush ( <i>Clethra alnifolia</i> ), blue huckleberry ( <i>Gaylussacia frondosa</i> var. <i>tomentosa</i> ), St. Andrew's cross ( <i>Hypericum hypericoides</i> ), mountain laurel ( <i>Kalmia latifolia</i> ), coastal doghobble ( <i>Leucothoe axillaris</i> ), and possumhaw. Hurricane Lake, Karick Lake, and Bear Lake are all converted seepage streams and alluvial forest.
Sandhill	Most abundant community in the southernmost region within TA-8 and TA-9. Dominated by widely spaced longleaf pine, turkey oak ( <i>Quercus laevis</i> ), and wiregrass. Other plant species include bluejack oak, sparkleberry ( <i>Vaccinium arboreum</i> ), common persimmon ( <i>Diospyros virginiana</i> ), and gopher apple ( <i>Licania michauxii</i> ). Sandhill requires growing season fires every 1 to 3 years to maintain open structure.
Seepage slope	Occurs adjacent to alluvial forest/baygall communities. Dominated by grass and sedge communities occurring on slopes with constant seepage from a perched water table where the ground is usually saturated but rarely inundated. These communities have very few trees and only occasional shrubs. Seepage slopes are historically open and dominated by a dense groundcover of wiregrass and toothache grass ( <i>Ctenium aromaticum</i> ). Community also supports pockets of carnivorous bog plants, especially pitcher plants ( <i>Sarracenia</i> spp.) and sundews ( <i>Drosera</i> spp.).
Baygall	Occurs at the edges of floodplains and along seepage streams and drainages from surrounding upland pine and sandhill communities. They are generally shrubby or forested seepage areas dominated by sweetbay ( <i>Magnolia virginiana</i> ), swamp bay ( <i>Persea palustris</i> ), black titi ( <i>Cliftonia monophylla</i> ), and titi ( <i>Cyrilla racemiflora</i> ). Seepage from surrounding uplands maintains a saturated substrate with peat moss ( <i>Sphagnum</i> spp.), often forming mats. Baygalls are most commonly interlaced with alluvial forests and may also occur in broad grassy wet flatwoods communities at the bases of seepage slopes. Dominant baygall species are typically fire-intolerant.

**Table 5-39. Ecological Communities Within BRSF, Cont'd**

Vegetation Type	Description
Upland hardwood forest	Well-developed, closed-canopy forests of upland hardwoods on rolling hills occurring sporadically on rich hillsides. In the northeast corner of the forest, hardwood forests may have been more common prior to forest disturbance. The canopy is a mixture of deciduous species, mostly oaks ( <i>Quercus</i> sp.) and occasionally American beech ( <i>Fagus grandifolia</i> ) and southern magnolia. Subcanopy and shrub layers are also well developed with a diversity of temperate species that grade gradually into upland pine on upper slopes and alluvial forest/baygalls on lower slopes. Mature hardwood forests create fire-resistant conditions through shading, reduction of herbaceous groundcover, and buildup of oak leaf litter, so fires from adjacent communities should be allowed to naturally extinguish at the edges of upland hardwood forest.
Mesic flatwoods	Open-canopied pine forests, predominately longleaf pine, with little to no mid-story and a fairly dense low shrub and herb layer. Occurs on relatively flat terrain with moderate to poor drainage, adjacent to alluvial forest with a very gradual transition to upland pine or sandhill and distinguished by an abundance of running oak ( <i>Quercus elliotii</i> ), dwarf live oak ( <i>Quercus minima</i> ), hairy laurel ( <i>Kalmia hirsuta</i> ), and false rosemary ( <i>Conradina canescens</i> ) in the short shrub and herb layers. Some mesic flatwoods sites in TA-9 have been converted to slash pine plantations.
Blackwater stream	Consists of Coldwater Creek, Blackwater River, Juniper Creek, Sweetwater Creek, Panther Creek, and Penny Creek. These are perennial or intermittent seasonal watercourses with sandy bottoms originating deep in sandy lowlands. Characteristic of tea-colored waters laden with tannins and are generally acidic. Emergent and floating aquatic vegetation growth is often reduced because of typically steep banks and considerable seasonal fluctuations in water level. Plant communities along these streams are usually either alluvial forest dominated by Atlantic white cedar or floodplain swamp dominated by pond cypress ( <i>Taxodium ascendens</i> ).
Floodplain swamp	Floodplain swamps are located along streams mostly in the southern portion of BRSF. They occur on the lowest parts of the floodplain and have a well-developed canopy of buttressed trees dominated by either pond cypress in the south or mostly swamp tupelo ( <i>Nyssa sylvatica</i> var. <i>biflora</i> ) in the north. Other canopy plant species include red maple, Atlantic white cedar, sweetbay, and slash pine. Some shrubs such as coastal sweet pepperbush ( <i>Clethra alnifolia</i> ), titi ( <i>Cyrilla racemiflora</i> ), wax myrtle, and fetterbush and hydrophytic herbs such as goldenclub ( <i>Orontium aquaticum</i> ) and common arrowhead ( <i>Sagittaria latifolia</i> ) may be sporadic.
Dome swamp	Occurs within upland pine and sandhills forming small, forested depressions consisting of a canopy of swamp tupelo and some pond cypress in the southern regions. Other tall shrubs and small trees include myrtle dahoon, swamp bay ( <i>Persea palustris</i> ), sweetbay ( <i>Magnolia virginiana</i> ), fetterbush, and large gallberry. Also may contain a clear herbaceous ring around these dome swamps forming an ecotone with the surrounding upland community. These ecotones are similar to wet prairies. Swamps that have been surrounded by development from agricultural and siccultural activities generally lack the wet prairie ecotone edge, potentially smothered by sediment from forest roads.
Depression marsh	Occurs in upland pine and sandhill communities creating a small, open circular basin dominated by herbaceous vegetation. An acidic peat layer of sphagnum moss ( <i>Sphagnum</i> sp.) may also develop. Some marshes may have formed from seepage streams that have been dammed.
Seepage stream	Occurs in troughs of high rolling hills and bordered by closed canopy baygall/alluvial forests. These streams typically form the headwaters of many alluvial and blackwater streams and generally have sandy bottoms. Plants are not frequently found in these shallow ground waters that have percolated through deep, sandy, upland soils.

Sources: FDACS, 2013; FNAI, 2010

BRSF = Blackwater River State Forest; TA = tactical area

### 5.8.1.2 Wildlife

#### **Proposed Action/Subalternative 1 (Preferred Alternative)**

Florida's Wildlife Management Area (WMA) system is managed by the FWC to sustain the widest possible range of native wildlife in their natural habitats. BRSF consists of four WMAs: Blackwater WMA, the Yellow River WMA, the Blackwater Carr Unit, and the Blackwater Hutton Unit (FFS, 2013b).

The FFS and FWC cooperatively maintain 60 acres of permanent wildlife openings and 214 acres of planted food plots on BRSF. These areas range from 0.1 to 15.4 acres and are established and maintained in accordance with the FFS State Forest Handbook (FDACS, 2013).

The Great Florida Birding Trail passes through BRSF, and many migratory and year-round birds can be found such as mourning dove, myrtle warbler, red-tailed hawk, red-headed woodpecker (*Melanerpes erythrocephalus*), and the Carolina wren (FWC, 2013a). Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703–712) and EO 913186. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. Federal agencies are to integrate bird conservation principles, measures, and practices into agency activities and avoid or minimize adverse impacts on migratory bird resources. Also, federal agencies must notify the USFWS in advance of conducting an action that is intended to take migratory birds. Hunting is allowed in designated areas throughout BRSF. Game animals include deer, wild hog, turkey, gray squirrel, quail, raccoon, bobcat, waterfowl, crow, and dove, among others (FDACS, 2013).

### 5.8.1.3 Protected Species

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

Three federally listed endangered species are found within BRSF, the red-cockaded woodpecker (*Picoides borealis*) (RCW), the reticulated flatwoods salamander (*Ambystoma bishopi*) and the Choctaw bean mussel (*Villosa choctawensis*). The longleaf pine ecosystem of BRSF provides the perfect habitat for the RCW. With the implementation of the *Recovery Plan for the Red-cockaded Woodpecker* (*Picoides borealis*) (USFWS, 2003), the population of RCWs is recovering, with over 90 active clusters which includes 89 potential breeding pairs documented on BRSF (Gault, 2013). Nesting season occurs between April and July. Four breeding ponds for the reticulated flatwoods salamander occur in the Yellow River Ravines TA (TA-9) and are protected within this species critical habitat. The Choctaw bean and critical habitat for this species are found in TA-9 within the Yellow River.

There are several federally listed threatened species. One federally listed threatened species on BRSF is the eastern indigo snake (*Drymarchon couperi*). Habitat for this species seems to be good within BRSF, however, the eastern indigo snake has not been found on BRSF for many years (FDACS, 2013). Three mussels, the narrow pigtoe (*Fusconia escambia*), southern sandshell (*Hamiota australis*) and fuzzy pigtoe (*Pleurobema strodeanum*), and their critical habitat are found in TA-9 in the Yellow River.

One state-listed threatened species on BRSF is the gopher tortoise (*Gopherus polyphemus*). The gopher tortoise is associated mainly with sandhill habitat. They dig



deep burrows for shelter and forage on low-growing plants. Nesting occurs during May and June, and hatching occurs from August through September (FWC, 2001).

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*), another federally listed threatened species, can be found in several rivers throughout Florida and spends the major part of the year in freshwater, migrating to saltwater in the fall. Movement from the Gulf of Mexico and upriver movement generally occur between February and April when spawning season occurs, while downriver movement occurs between September and November.

The Southeastern American kestrel, a state-listed threatened species, is a non-migratory, permanent resident in Florida that resides best in the southeastern sandhill ecosystem, consisting of widely spaced canopy of longleaf pine or slash pine with wiregrass and forb dominated groundcover. Because this species are secondary cavity nesters, the Southeaster American kestrel has been known to occupy empty tree cavities excavated by woodpeckers and man-made nest boxes. Two Florida bog frogs have been documented in the Yellow River TA (TA-9) within BRSF on Garnier Creek and Julian Mill Creek. This state-listed species of special concern inhabits shallow, slow-flowing, acidic seeps and boggy overflows of large seepage streams and pond edges, often associated with a variety of herbs, forbs, grasses, mosses, and lichens.

The bald eagle has been federally delisted due to its recovery; however, it is afforded protection under the BEPA. Nesting season occurs between October 1 through May 15, which includes egg laying, hatching and rearing young, and fledgling young. Bald eagles nest in mature or old-growth trees and cliffs, seeking high places for a view of the water where they are known to forage. Currently there is one documented bald eagle nest in TA-2, two in TA-3, one in TA-4, and one in TA-7 (FWC, 2013XC).

In August 2012, FWC removed the Florida black bear from the state-threatened species list; however, the species is protected under the Florida Black Bear Conservation Rule [Florida Administrative Code (FAC) 68A-4.009]. Additionally, FWC developed a *Florida Black Bear Management Plan* (FWC, 2012) to continue implementing conservation of the species and mitigate human-bear interactions. The southern area of BRSF is within a portion of the West Panhandle Bear Management Unit where bear population is less dense with inconsistent evidence of breeding.

Potential impacts from the Proposed Action to federally listed species require the Air Force to consult with the USFWS regarding impacts to federally protected species. The Air Force has conducted Endangered Species Act Section 7 consultation with the USFWS for action alternatives, and the USFWS has concurred with the Air Force determination that it may affect but is not likely to adversely affect endangered species (USFWS, 2014). [Table 5-40](#) includes all federally listed and state-listed species known to occur or with the potential to occur within BRSF. Some bird and wildlife species have the potential to occur throughout several TAs within BRSF, depending on habitat associations and feeding habits. Plant species with a recorded occurrence within a particular TA are noted as confirmed in [Table 5-40](#).

**Table 5-40. Protected Species Known or Potentially Occurring in BRSF**

Species <sup>1</sup>	Tactical Area								
	1	2	3	4	5	6	7	8	9
●=Confirmed present; ○=Not present; ◻=Potential to occur									
<b>Amphibians</b>									
Reticulated flatwoods salamander ( <i>Ambystoma bishopi</i> ) LE/FE	○	○	○	○	○	○	○	○ <sup>2</sup>	●
Pine barrens treefrog ( <i>Hyla andersonii</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Gopher frog ( <i>Rana capito</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Florida bog frog ( <i>Rana okaloosae</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	●
<b>Molluscs</b>									
Choctaw bean ( <i>Villosa choctawensis</i> ) LE	○	○	○	○	○	○	○	○	● <sup>4</sup>
Narrow pigtoe ( <i>Fusconia escambia</i> ) LT	○	○	○	○	○	○	○	○	● <sup>4</sup>
Southern sandshell ( <i>Hamiota australis</i> ) LT	○	○	○	○	○	○	○	○	● <sup>4</sup>
Fuzzy pigtoe ( <i>Pleurobema strodeanum</i> ) LT	○	○	○	○	○	○	○	○	● <sup>4</sup>
<b>Reptiles</b>									
Eastern indigo snake ( <i>Drymarchon couperi</i> ) LT/FT	◻	◻	◻	◻	◻	◻	◻	◻	◻
Gopher tortoise ( <i>Gopherus polyphemus</i> ) C/ST	●	●	●	●	◻	◻	◻	●	◻
Alligator snapping turtle ( <i>Macrochelys temminckii</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Florida pine snake ( <i>Pituophis melanoleucus mugitus</i> ) N/SSC	◻	◻	◻	◻	●	◻	◻	◻	◻
<b>Birds</b>									
Red-cockaded woodpecker ( <i>Picoides borealis</i> ) LE/FE	●	●	●	○	●	●	○	●	○
Bald eagle ( <i>Haliaeetus leucocephalus</i> ) BEPA	◻	●	●	●	◻	◻	●	◻	◻
Southeastern American kestrel ( <i>Falco sparverius paulus</i> ) N/ST	●	●	●	◻	●	◻	●	●	◻
<b>Mammals</b>									
Sherman's fox squirrel ( <i>Sciurus niger shermani</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
Eastern chipmunk ( <i>Tamias striatus</i> ) N/SSC	◻	◻	◻	◻	◻	◻	◻	◻	◻
<b>Fish</b>									
Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> ) FT/ST	○	○	○	○	○	○	○	○ <sup>3</sup>	○ <sup>3</sup>
<b>Plants</b>									
Hairy wild indigo ( <i>Baptisia calycosa</i> var. <i>villosa</i> ) N/LT	◻	◻	◻	◻	◻	◻	◻	◻	◻
Sweet shrub ( <i>Calycanthus floridus</i> ) N/LE	◻	◻	●	◻	◻	◻	◻	◻	◻
Piedmont jointgrass ( <i>Coelorachis tuberculosa</i> ) N/LT	◻	◻	◻	◻	◻	◻	◻	◻	◻

**Table 5-40. Protected Species Known or Potentially Occurring in BRSF, Cont'd**

Species <sup>1</sup>	Tactical Area								
	1	2	3	4	5	6	7	8	9
Spoon-leaved sundew ( <i>Drosera intermedia</i> ) N/LT	●	●	●	◐	◐	◐	◐	●	◐
Trailing arbutus ( <i>Epigaea repens</i> ) N/LE	◐	◐	◐	◐	◐	◐	◐	◐	◐
Dwarf witch alder ( <i>Fothergilla gardenii</i> ) N/LE	◐	●	◐	◐	●	◐	◐	◐	◐
Mountain laurel ( <i>Kalmia latifolia</i> ) N/LT	◐	●	●	●	◐	●	◐	◐	◐
Bog button ( <i>Lachnocaulon digynum</i> ) N/LT	◐	◐	◐	◐	◐	◐	◐	◐	◐
Panhandle lily ( <i>Lilium iridollae</i> ) N/LE	●	◐	◐	◐	◐	◐	◐	◐	◐
Hummingbird flower ( <i>Macranthera flammea</i> ) N/LE	◐	◐	◐	◐	●	◐	◐	◐	◐
Primrose-flowered butterwort ( <i>Pinguicula primuliflora</i> ) N/LE	●	◐	◐	◐	◐	●	◐	◐	◐
Little club-spur orchid ( <i>Platanthera clavellata</i> ) N/LE	◐	◐	◐	◐	◐	◐	◐	◐	◐
Yellow fringeless orchid ( <i>Platanthera integra</i> ) N/LE	◐	◐	◐	◐	◐	◐	◐	◐	◐
Giant orchid ( <i>Pteroglossaspis ecristata</i> ) N/LT	◐	◐	◐	◐	◐	◐	◐	◐	◐
Arkansas oak ( <i>Quercus arkansana</i> ) N/LT	◐	●	◐	◐	◐	◐	◐	◐	◐
Small-flowered meadowbeauty ( <i>Rhexia parviflora</i> ) N/LE	◐	◐	◐	◐	◐	◐	◐	●	◐
Florida flame azalea ( <i>Rhododendron austrinum</i> ) N/LE	◐	◐	◐	◐	◐	●	◐	◐	◐
Hairy-peduncled beaksedge ( <i>Rhynchospora crinipes</i> ) N/LE	◐	◐	◐	◐	◐	◐	◐	◐	◐
White-top pitcherplant ( <i>Sarracenia leucophylla</i> ) N/LE	●	●	●	◐	●	●	◐	●	◐
Sweet pitcherplant ( <i>Sarracenia rubra</i> ) N/LT	●	◐	◐	●	◐	◐	◐	◐	◐
Harper's yellow-eyed grass ( <i>Xyris scabrifolia</i> ) N/LT	◐	◐	◐	◐	◐	◐	◐	◐	◐

Sources: FDACS, 2013; USFWS, 2013; FNAI, 2013a

BEPA = Bald Eagle Protection Act; FWC = Florida Fish and Wildlife Conservation Commission;

TA = tactical area; USFWS = United States Fish and Wildlife Service; Federal status (USFWS):

LE = listed endangered, LT = listed threatened, C = candidate, N = not currently listed

State status (FWC except where noted): LE = listed endangered, LT = listed threatened, FE = listed as endangered species at the federal level by the USFWS, FT = listed as threatened species at the federal level by the USFWS, SSC = species of special concern, ST = state population listed as threatened by the FWC

●=Confirmed present; ○=Not present; ◐=Potential to occur

1. Descriptions of most species can be found at <http://fnaai.org/bioticssearch.cfm>.

2. Critical habitat occurs within and adjacent to TA-8.

3. Gulf Sturgeon habitat does not occur on BRSF, however, critical habitat for this species is located adjacent to TA-8 and TA-9.

4. Critical habitat occurs in the Yellow River adjacent to TA-9.

#### 5.8.1.4 Sensitive Habitats

##### *Proposed Action/Subalternative 1 (Preferred Alternative)*

As stated previously, BRSF is home to the largest contiguous longleaf pine/wiregrass ecosystem in the world. Longleaf pine communities provide habitats for many plants and animals, including many classified as endangered, threatened, or species of special concern (SSC). This ecosystem once covered over 90 million acres in the southeastern U.S., and now less than 3 million acres remain (FDACS, 2013). Longleaf pine–wiregrass flatwoods and slash pine flatwoods terrestrial habitat is crucial for the recovery of the RCW and the reticulated flatwoods salamander. Conservation of wetlands and ponds is also crucial for the reticulated flatwoods salamander to breed. See Section [5.7.1, Water Resources – Affected Environment](#), for information on wetlands, floodplains, and other bodies of water throughout BRSF that are important habitat areas for the conservation of protected species.

Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Red-cockaded woodpeckers excavate cavities in live pines; these cavities constitute a critical resource. Longleaf pine is a preferred tree species for cavity excavation, because it produces a long-lasting resin that creates an effective barrier against climbing snakes (USFWS, 2003). [Table 5-41](#) lists documented RCW tree cavities of an active, inactive, or unknown status and are differentiated in [Figure 5-63](#) through [Figure 5-72](#) (which depict water and biological resources at BRSF).

Other sensitive habitats include gopher tortoise burrows. Both the tortoise and its burrow are protected under state law. Gopher tortoises share these burrows with more than 360 other species, such as the federally threatened eastern indigo snake. The gopher tortoise is associated with sandhill habitat and well-drained uplands with associated wetlands (FWC, 2001).

Additionally, FWC has developed Species Action Plans (FWC, 2013c;FWC, 2013d) for the conservation of endangered, threatened, or species of special concern, including the Southeastern American kestrel and the Florida bog frog. FWC has been working towards habitat conservation by ongoing surveys, distributing nest boxes within suitable habitat for the Southeastern American kestrel, and other habitat enhancement projects. FWC and FFS established five experimental Florida bog frog habitat restoration units along Garnier Creek in TA-9 during the winter of 2012-2013. There are plans to apply similar restoration practices along Julian Mill Creek during 2014-2015.

Critical habitat for the Gulf sturgeon habitat is found outside the southern area of BRSF adjacent to TA-8 and TA-9 in the Blackwater River and the Yellow River, respectively. Additionally, critical habitat for the reticulated flatwoods salamander is found outside of BRSF, southwest and adjacent to TA-8 and within and adjacent to the eastern region of TA-9. As stated previously, four breeding ponds are found along the eastern border of the Yellow River TA (TA-9) for the reticulated flatwoods salamander and protected within this species critical habitat. Critical habitat for the four species of mussel listed in [Table 5-38](#) is found in the Yellow River along the boundary of TA-9.

Pitcher plant bogs, typically located within seepage slopes, are found scattered throughout BRSF. They occur in isolated depressions of somewhat poorly drained soils. Steps are taken to preserve and protect these areas because they contain a high

diversity of rare plant species (FDACS, 2013). [Table 5-41](#) lists documented sensitive habitats that occur within BRSF.

**Table 5-41. Occurrence of Sensitive Habitats Within BRSF**

Habitat Type	Tactical Area (Number Documented)								
	1	2	3	4	5	6	7	8	9
RCW tree cavities <sup>1</sup>	131	112	293	13	366	167	10	175	-
Gopher tortoise burrows <sup>2</sup>	513	567	256	81	197	431	691	719	-
Reticulated flatwoods salamander breeding ponds	-	-	-	-	-	-	-	-	4
Florida bog frog <sup>3</sup>	-	-	-	-	-	-	-	-	7
Pitcher plant bogs	4	10	13	3	7	9	-	1	-
Southeastern American kestrel nest boxes <sup>2</sup>	1	7	3	-	1	-	5	2	-
Bald eagle nests	-	1	2	1	-	-	1	-	-

Source: FFS, 2012a

BRSF = Blackwater River State Forest; RCW = red-cockaded woodpecker

1. Includes active, inactive, or unknown status of tree cavities. "Inactive" can include dead or abandoned.

2. Includes active, inactive, or possibly active status of burrows or nests. "Inactive" can include abandoned.

3. Includes two documented Florida bog frogs and five habitat restoration units on Gamier Creek.

### 5.8.1.5 Invasive Species

#### ***Proposed Action/Subalternative 1 (Preferred Alternative)***

FFS continually monitors BRSF for nonnative invasive species. Invasive species have the potential to compete with and displace native species. FFS staff conducts surveys and record data into a GIS database, which is updated as new plants are discovered. Some invasive species identified within BRSF include cogon grass (*Imperata cylindrical*), Chinese tallow (*Sapium sebiferum*), Japanese climbing fern (*Lygodium japonicum*), Chinese privet (*Ligustrum sinense*), Chinese wisteria (*Wisteria sinensis*), mimosa (*Albizia julibrissin*), and Japanese honeysuckle (*Lonicera japonica*). The invasive species most found on BRSF are cogon grass and Japanese climbing fern, which have spread significantly since Hurricane Ivan (FDACS, 2013).

[Table 5-42](#) lists the number of documented invasive plant species surveyed. Each documented occurrence or location corresponds to an invasive species point shown on [Figure 5-63](#) through [Figure 5-72](#), which can represent an isolated occurrence or populations of multiple individuals. Invasive species can spread rapidly; however, the FFS continuously monitors and mitigates to control or eradicate invasive species throughout BRSF.

In addition to invasive plants, feral hogs (*Sus scrofa*) are present in some areas of BRSF. (FWC has issued a feral hog control trapping permit to FFS and encourages removal of this invasive species through trapping and hunting [FDACS, 2013]).

**Table 5-42. BRSF Tactical Areas with Invasive Species**

Invasive Species	Tactical Area								
	1	2	3	4	5	6	7	8	9
Documented occurrence (number of locations <sup>1</sup> )	23	7	13	14	7	1	12	1	1

Source: FNAI, 2011

1. One occurrence could refer to a single plant, a combination of scattered plants, or clumps surveyed.



## 5.8.2 Environmental Consequences

As discussed in Section [3.8](#), potential adverse impacts to biological resources may occur from dismounted maneuvers, UoEX, and aircraft and AO. Other proposed action effectors are not addressed in this section. The general analysis presented in Section [3.8](#) covers potential impacts to affected environment resources identified in Section [5.8.1](#).

Impact assessment considers implementation of the General Operational Constraints inherent to the both the Proposed Action and Subalternative 1 as identified in Section [2.5](#). These constraints, such as establishment of buffers around sensitive species locations and habitat, serve to minimize potentially adverse impacts and, in some cases, avoid adverse impacts altogether. Avoidance areas for biological resources are identified in [Figure 5-1](#) through [Figure 5-10](#) and [Figure 5-11](#) through [Figure 5-20](#). General Operational Constraints identified in Section [2.5](#) require that all identified sensitive species locations and habitat would be protected, and aspects of EAFBI 13-212 and Eglin AFB sensitive species consultations would be implemented as part of the action alternatives.

Additionally, impact analyses rely heavily on analysis and results as presented in the Interstitial Area Range Final Environmental Assessment Revision 2, Eglin AFB Interstitial Area Biological Opinion, Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion, and the Eglin AFB Riverine/Estuarine Biological Assessment. These documents analyze potential impacts to resources on the Eglin Range from activities associated with the action alternatives. The resources addressed are similar to those that occur on BRSF (BRSF is adjacent to the Eglin Range). Impacts to BRSF biological resources identified in Section [5.8.1](#) would be the same as those described in Section [3.8](#).

### 5.8.2.1 Vegetation

[Table 5-43](#) provides a summary of impacts to vegetation in each TA from both the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

#### ***Proposed Action***

The Proposed Action would cause adverse impacts to vegetation at BRSF. Most impacts to vegetation under the Proposed Action would result from temporary disturbances, such as trampling associated with ground movements, landing of aircraft, or minor ground disturbance, and would be recoverable through natural processes.

Potential wildfires resulting from expendables would impact BRSF ecological communities. As noted in Section [5.8.1.1](#), upland pine is the largest ecological community in BRSF and mainly consists of a longleaf pine/wiregrass ecosystem. Generally, controlled fire can be beneficial to ecological communities and species by maintaining the grassy understory and preventing mid-story encroachment. However, wildfires can damage the habitats of species that rely on these communities. According to the *Final Environmental Assessment for the Eglin AFB Integrated Natural Resource Management Plan Activities*, Eglin averages 110 wildfires annually, with an average size of 60 acres. The majority of these wildfires are due to mission activities, primarily

ordnance and pyrotechnics use (U.S. Air Force, 2013a). By comparison, BRSF averages 24 wildfires annually, with an average size of 30 acres (FDACS, 2013). Blanks and GBSs are noise-generating expendables that would only be used at two hardened camp sites at BRSF (SRYA Camp and STOP Camp). The potential for wildfires would mainly be due to the use of smoke grenades, which could be used throughout areas at BRSF within the LU-1 protection level under fire restrictions identified in Section 2.5. These constraints would reduce the chance of wildfires caused by military activities at BRSF. Additionally, the FFS utilizes a fire management program that includes wildfire prevention, detection and suppression, and prescribed burning that would also help to minimize wildfire potential.

### **Subalternative 1 (Preferred Alternative)**

Impacts to vegetation under Subalternative 1 would be similar to the Proposed Action but greatly reduced due to the limited activities, location of activities, and reduced frequency and duration. Any dismounted movement is localized to one proposed movement corridor between Blackwater Airfield in TA-2 and the hardened camp site (STOP Camp) in TA-6. Additionally, only 13 LZ/DZs are designated for use and consist of disturbed open areas and wildlife openings within TA-1, -2, -6, -7, and -9. Therefore, little to no impacts to vegetation are expected to occur. Wildfire potential would be greatly reduced due to having expendable use limited to hardened camp sites only.

**Table 5-43. Proposed Action/Subalternative 1 Vegetation Impacts by TA at BRSF**

Table 3-1. Proposed Action/Subalternatives and Potential Impacts by Effector									
Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.								
Point impact									
Incidental surface Disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.								
Dismounted Movement	<b>Proposed Action:</b> Adverse and unavoidable impacts would be from incidental direct physical impact (trampling). the intensity of the impacts would be minimized given implementation of General Operational Constraints associated with regulating unit size and rotating use areas, thus allowing recovery of vegetation over the short term. <b>Subalternative 1:</b> Potential impacts would be minimized greatly given that troop movements would be limited to 13 LZ/DZ areas and one proposed movement corridor.								
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> Potential adverse impacts associated with increased wildfire potential from expendables and equipment usage. This increased potential would be unavoidable, and would persist over the long term. However, implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices would reduce the intensity of the impacts. <b>Subalternative 1:</b> All expendable usage would be limited to hardened camp sites only in BRSF and therefore would greatly reduce the potential for wildfires to occur.								
Smoke grenades									
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.								
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.								

**Table 5-43. Proposed Action/Subalternative 1 Vegetation Impacts by TA at BRSF, Cont'd**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Amphibious Operations	<b>Proposed Action:</b> Potential adverse impacts to shoreline and aquatic vegetation due to trampling/rutting associated with landing of watercraft along shorelines. Impacts would be short term and recoverable through Operational Constraints such as rotation of established landing sites. <b>Subalternative 1:</b> No amphibious operations would occur under Subalternative 1 and therefore potential impacts to shoreline or aquatic vegetation are not expected to occur.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone; STOP = Short-Term Offender Program; TA = tactical area

### 5.8.2.2 Wildlife

[Table 5-44](#) provides a summary of impacts to wildlife in each TA from both the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-44. Proposed Action/Subalternative 1 Wildlife Impacts by TA at BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.								
Dismounted movement									
<b>Proposed Action:</b> Potential for unavoidable incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). Probability for impact is low as a result of implementation of General Operational Constraints. <b>Subalternative 1:</b> Potential impacts would be minimized greatly given that troop movements would be limited to 13 LZ/DZ areas and one proposed movement corridor.									
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> There is a potential for adverse impact associated with increased wildfire potential from expendables usage. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> All expendable usage would be limited to hardened camp sites only in BRSF and therefore would greatly reduce the potential for wildfires to occur.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> Potential adverse impacts associated with disturbance from noise. However, aircraft noise would be temporary and intermittent in nature, allowing any dispersed wildlife to return to the area once aircraft have left the area. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife. <b>Subalternative 1:</b> Potential impacts associated with noise disturbance on wildlife would be limited to areas surrounding 13 designated locations (including Blackwater Airfield) for LZ/DZ. These locations are found within TA-1, -2, -6, -7, and -9.								
Amphibious Operations	<b>Proposed Action:</b> Increased potential for direct physical impact by boat strike or indirect impact by disturbance or harassment. This increased potential would be unavoidable, and would persist over the long term. Boat landings and nearshore activities would potentially result in shoreline erosion, potentially impacting aquatic wildlife, as stated in Section 5.7.3. However, the potential would be minimized through implementation of General Operational Constraints. <b>Subalternative 1:</b> No amphibious operations would occur under Subalternative 1 and therefore potential impacts to aquatic wildlife are not expected to occur.								

### ***Proposed Action***

The Proposed Action would potentially cause adverse impacts to wildlife including migratory birds. Because military readiness activities are exempt from the Migratory Bird Treaty Act, except in cases where significant adverse impacts to a population are likely, the Proposed Action is exempt from incidental takes to migratory birds. A consultation with the USFWS associated with migratory birds is not required. Impacts would be related to temporary disturbances associated with harassment and/or displacement associated with general training activity, minor land disturbances, noise from expendable use, and wildfire potential. Survival training is a critical component of military training. It involves foraging and training personnel on critical survival skills (which includes teaching how to prepare traps and snares). It does not involve substantial consumption of natural resources and the likelihood of successful snaring or trapping is traditionally minimal. Therefore the permanent disturbances associated with consumption of wildlife would be intermittent and recoverable through natural processes and would result in a negligible long-term impact. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife.

### ***Subalternative 1 (Preferred Alternative)***

Impacts to wildlife under Subalternative 1 would be similar to the Proposed Action but minimized due to limited activities, location of activities, and reduced frequency and duration. Wildfire potential would be minimized due to the use of expendables only to be used at hardened camp sites. Noise impacts from aircraft operations would also be limited to areas surrounding 13 designated LZ/DZ locations (located in TA-1, -2, -6, -7, and -9). [Figure 5-73](#) through [Figure 5-77](#) show these designated LZ/DZ relative to potential fly zone areas. Aircraft flying in and out of the LZ/DZs would potentially affect some wildlife species as a result of noise and visual presence. Response to aircraft noise varies by species, aircraft characteristics, speed of travel, rotary-wing vs. fixed-wing, previous exposure, and whether the animal is in the incubation/nesting phase. Some animal species may be more sensitive than other species and/or may exhibit different forms or intensities of behavioral responses. Common responses include the “startle” or “fright” response. Intensities and durations of the startle response decrease with the numbers and frequencies of exposures. Mammals appear to react to noise at sound levels higher than 90 dB SEL, and low-level aircraft with a visual presence would potentially elicit a stronger reaction than noise alone. GLI aircraft would transit to and from the LZ/DZs at an altitude of 500 feet AGL. SELs from proposed GLI aircraft at 500 feet would reach 95 SEL; thus aircraft overflights would likely result in startle responses from birds and wildlife on a daily basis. Flight paths would vary, limiting the likelihood of multiple exposures to a particular area or group of wildlife within a given day. Over time some birds and wildlife may become accustomed to the noise with diminished response. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife. Consumption of wildlife would not occur under Subalternative 1. Any disturbances associated with direct impact or harassment and/or displacement associated with dismounted movement would be less than the Proposed Action given that only one proposed movement corridor will be used between Blackwater Airfield in TA-2 and the hardened camp site (STOP Camp) in TA-6 (see [Figure 5-76](#)). Additionally, other ground movement activity such as blackout driving and bivouacking/assembly areas would not occur.

### 5.8.2.3 Protected Species

[Table 5-45](#) provides a summary of impacts to protected species in each TA from both the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green). Most impacts would be related to temporary disturbances, which would be minimized by avoidance measures.

**Table 5-45. Proposed Action/Subalternative 1 Protected Species Impacts by TA at BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> Known protected species locations would be protected (see <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ). The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.								
Dismounted movement	<b>Proposed Action:</b> Known protected species locations would be protected (see <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ). Potential direct physical impacts resulting in mortality, trampling, or disturbance of transient protected species. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated by distributing educational materials to familiarize personnel with protected species so that troops can avoid transient species where possible. Additionally, established buffer areas around protected species habitats would be utilized. <b>Subalternative 1:</b> Potential impacts would be minimized greatly given that troop movements would be limited to 13 LZ/DZ areas and one proposed movement corridor. Established buffer areas around protected species habitats would be implemented.								
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> Use of Expendables would avoid known protected species locations ( <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ). Utilization of blanks and GBSs would be restricted to hardened camp sites, thus minimizing potential noise impacts. Potential adverse impacts associated with increased wildfire potential from utilization of expendables is unavoidable. These impacts are regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to BRSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> All expendable usage would be limited to hardened camp sites only in BRSF and therefore would greatly reduce the potential for wildfires to occur.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> Potential adverse impacts associated with noise disturbance. Impacts would be short term, localized, and mitigated through avoidance of known species locations and associated habitat (see <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ), resulting in unavoidable, intermittent impacts to transient species. However, these impacts would not be considered significant given the context, intensity, and duration. <b>Subalternative 1:</b> Potential impacts associated with noise disturbance on protected species would be limited to areas surrounding 13 designated locations (including Blackwater Airfield) for LZ/DZ. These locations are found within TA-1, -2, -6, -7, and -9. Any sensitive species that may be impacted by proposed flight paths would be avoided and established buffer areas around protected species habitats would be implemented.								
Amphibious Operations	<b>Proposed Action:</b> Known protected species locations would be protected (see <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ). Potential for incidental direct physical impacts (boat strike) or incidental indirect impact of transient protected species could result; however, this potential is minimized given the proposed operational frequency and likelihood that any aquatic species would move from harm's way. As stated in Section <a href="#">5.7.3</a> , boat landings and nearshore activities would potentially result in shoreline erosion potentially impacting protected aquatic species. However, the potential would be minimized by avoiding known locations of species and use of designated boat landings and crossings. <b>Subalternative 1:</b> No amphibious operations would occur under Subalternative 1 and therefore potential impacts to protected aquatic species are not expected to occur.								



### ***Proposed Action***

As discussed in Section [3.8](#), protected species could be directly impacted by vehicle collisions, land disturbance, and expendables (from wildfire). Further, the effector mechanisms of noise and human activity related to military training are not unlike that of recreational hunting, logging, and other human activities that have been conducted at BRSF for many years. Thus, some species may have acclimated to noise and other disturbances. It is also unlikely that military training activities would drive bears to migrate outside of their habitat; however the potential for human-bear encounters would increase. In case of an encounter with a bear military personnel would leave the area. Vehicles would operate at or under 35 mph on BRSF dirt roads, which should reduce the chance for collision with bears, indigo snakes, or other animals that have been struck by vehicles in the past.

Noise-generating expendables (blanks/GBS) would only be used at the two hardened camp sites at BRSF, and these sites are not located near currently documented active RCW cavity trees and most other protected species. The bald eagle, which is not on the endangered list, but is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, nests in several locations within BRSF. The FWC would periodically provide nest coordinates to the Air Force to avoid all nests, observing a 1,000-foot buffer for aircraft and a 330-foot buffer for ground actions. See [Figure 5-69](#) and [Figure 5-70](#). Appendix H, Section H.2.8 provides additional information on effects of noise on species.

Survival training which involves foraging and training personnel on critical survival skills (including teaching how to prepare traps and snares), does not involve substantial consumption of natural resources and the likelihood of successful snaring or trapping is traditionally minimal. Additionally, [Figure 5-1](#) through [Figure 5-20](#) show buffer areas where sensitive species occur. In these buffer areas, training activities would either be restricted or limited at point locations. Therefore, the likelihood of impacting a sensitive species is very low. Section [2.5](#) identifies General Operational Constraints associated with sensitive species.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, impacts to protected species would be similar to the Proposed Action but minimized due to the limited activities, location of activities, and reduced frequency and duration. As stated earlier, wildfire potential would be minimized due to the use of expendables only to be used at hardened camp sites. Noise impacts on protected species from aircraft operations would also be limited to areas surrounding 13 designated LZ/DZ locations (located in TA-1, -2, -6, -7, and -9). As indicated in [Figure 5-75](#), one Florida bog frog location and five Florida bog frog restoration plots have been documented near LZ/DZ BW9. These areas would be avoided to the extent possible. Although the five Florida bog frog habitat restoration plots are within potential flight paths, activities would be intermittent and short-term. No other protected species have been documented to occur in the potential fly zone areas for LZ/DZ BW9 through BW12. Protected species have been documented in areas surrounding the remaining LZ/DZ areas but known locations would be avoided. [Figure 5-73](#) through [Figure 5-77](#) indicate biological resources relative to LZ/DZ areas in addition to potential fly zone areas and avian air operation buffers surrounding RCW nest (500-foot buffer) and bald eagle nests (1,000-foot buffer). By observing the buffer, estimated noise received at the

bald eagle nest would be at most 90 SEL from a C-130H or CV-22. The RCW avian buffer area extends 500 feet from the cavity trees, and a C-130H aircraft at that distance would generate noise approaching 95 SEL at the tree. The 90 SEL and 95 SEL levels of noise would not result in health or physiological impacts but could temporarily interfere with communications between individuals (Dooling and Popper, 2007). Birds communicate to establish territories and find mates. Appendix H, Section H.2.8 provides additional information on effects of noise on species. No reticulated flatwoods salamanders would be impacted by this alternative. Buffer areas would be avoided for air and ground movement activities as identified in Section 2.5, General Operational Constraints.

Natural resources would not be consumed under Subalternative 1, thereby eliminating any potential impacts from this activity as compared to the Proposed Action. Because no amphibious operations would occur under Subalternative 1, potential to impact protected aquatic species would not occur.

#### 5.8.2.4 Sensitive Habitats

Table 5-46 summarizes impacts to sensitive habitats in each TA from the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green).

**Table 5-46. Proposed Action/Subalternative 1 Sensitive Habitat Impacts by TA at BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> Known sensitive habitats would be protected (see <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> ). The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.								
Dismounted movement									
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> <a href="#">Figure 5-1</a> through <a href="#">Figure 5-20</a> show avoidance areas for sensitive habitats. Potential adverse impacts associated with increased wildfire potential from								
Smoke grenades									

**Proposed Action:** Only reticulated flatwoods salamander habitat, two Florida bog frog locations, and five Florida bog frog habitat restoration plots have been documented in this TA, which would be avoided. As a result, the Air Force has not identified any adverse impacts to biological resources associated with

**Table 5-46. Proposed Action/Subalternative 1 Sensitive Habitat Impacts by TA at BRSF, Cont'd**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Other/equipment	utilization of expendables would be unavoidable. These impacts would be regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to BRSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> All expendable usage would be limited to hardened camp sites only in BRSF and therefore would greatly reduce the potential for wildfires to occur.								these activities in this TA. <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.								
Amphibious Operations	<b>Proposed Action:</b> <a href="#">Figure 5-1</a> through <a href="#">Figure 5-10</a> show avoidance areas for sensitive habitats. Potential adverse impacts associated with activities in estuarine areas could result in direct physical impacts to aquatic vegetation along shorelines at ingress/egress points. However, impacts would be minimized to a negligible level through rotation of ingress/egress points and avoidance of areas exhibiting shoreline erosion as identified in Section 3.7.4. Additionally, as stated in Section 5.7.3, boat landings and nearshore activities would potentially result in shoreline erosion impacting protected aquatic vegetation. Any impacts would be recoverable over the short term with implementation of General Operational Constraints. <b>Subalternative 1:</b> No amphibious operations would occur under Subalternative 1 and therefore potential impacts to protected aquatic habitat are not expected to occur.								

AFB = Air Force Base; BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; LZ = Landing Zone; STOP = Short-Term Offender Program; TA = tactical area

### Proposed Action

Sensitive habitats with the potential to be impacted by the Proposed Action are shown in Figure 5-63 and discussed in Section 3.8. Additionally, Figure 5-1 through Figure 5-20 show sensitive species constraint areas that include documented RCW cavity trees, pitcher plant bogs, and reticulated flatwoods salamander habitat, Southeastern American kestral nest boxes, and Florida bog frog locations. Training activities would either be restricted at point locations or limited in those designated buffer areas. Impacts to vegetation, discussed in Section 5.8.2.1, also apply to sensitive habitats at BRSF; however, all known sensitive habitats would be protected to the extent possible during training activities. Section 2.5 identifies General Operational Constraints associated with sensitive habitats.

Areas potentially slated for ground-disturbing activities would be surveyed for gopher tortoises, and burrows would be avoided where possible. Burrows that cannot be avoided would be relocated in accordance with FWC guidelines. Additionally, there is a potential for wildfire from expended items to spread into other areas including those with sensitive habitats. Potential for wildfires to impact active RCW cavity trees would be lower in TA-4, TA-7, and TA-9, as no active RCW cavity trees have been documented in these TAs. The FFS works to prevent impacts to and manage fire-dependent habitats that support protected species through prescribed burning. Impacts from wildfires would be minimized to the extent possible through a program of prevention, response, and coordination with the FFS. Fire suppression activities, such as the use of heavy

machinery for fire response, could result in changes to the landscape, localized alterations to hydrology, sedimentation, and direct damage to vegetation.

### ***Subalternative 1 (Preferred Alternative)***

Impacts to sensitive habitats under Subalternative 1 would be similar to the Proposed Action, however minimized due to the reduction in proposed activities, frequency and duration. As indicated in [Figure 5-75](#), only Florida bog frog habitat, including five habitat restoration plots, have been documented to occur in areas surrounding LZ/DZ BW9 through BW12 and corresponding potential fly zone areas. As indicated in [Figure 5-73](#) through [Figure 5-77](#), sensitive habitats have been documented in areas surrounding the remaining LZ/DZ areas but known locations would be avoided and buffers implemented, such as the 500-foot avian air operations buffer surrounding all RCW nests and 1,000-foot avian air operations buffer surrounding bald eagle nests. One bald eagle nest near Bear Lake has the potential to be impacted from a proposed flight path from Blackwater Airfield. One Southeastern American kestrel nest box is located north of Blackwater Airfield and also has the potential to be impacted by a proposed flight path. Any impacts on affected sensitive habitats would be low, intermittent and short-term in duration. No Gulf sturgeon habitat or flatwoods salamander habitat would be impacted under this alternative. All known sensitive habitats would be protected to the extent possible during training activities and General Operational Constraints identified in Section [2.5](#) would be implemented.

Natural resources would not be consumed under Subalternative 1, thereby eliminating any potential impacts from this activity as compared to the Proposed Action. Because no amphibious operations would occur under Subalternative 1, potential to impact protected aquatic habitat would not occur.

### **5.8.2.5 Invasive Species**

[Table 5-47](#) provides a summary of invasive species impacts in each TA from the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-47. Proposed Action/Subalternative 1 Invasive Species Impacts by TA at BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.								
Incidentalsurface disturbance									
Point impact									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.								
Dismounted movement									

**Table 5-47. Proposed Action/Subalternative 1 Invasive Species Impacts by TA at BRSF, Cont'd**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> Indirectly, burned areas from wildfires started by expendables use could allow establishment and spread of invasives. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> All expendable usage would be limited to hardened camp sites only in BRSF and therefore would greatly reduce the potential for wildfires to occur. Invasive species are not known to occur around hardened camp sites at BRSF, therefore no adverse impacts associated with invasive species are known to occur as a result of these activities.								
Smoke grenades									
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.								
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.								
Amphibious Operations									

AFB = Air Force Base; BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

### **Proposed Action**

As discussed in Section 3.8, the Proposed Action would potentially cause adverse impacts associated with the spread of invasive species resulting from use of expendables and the associated potential for wildfire. Implementation of General Operational Constraints and identified in Section 2.5 would reduce the potential for spreading invasive species.

### **Subalternative 1 (Preferred Alternative)**

The potential for invasive species to be impacted by wildfires under Subalternative 1 is low to none since expendable use is limited to hardened camp sites only. Implementation of General Operational Constraints identified in Section 2.5 would reduce the potential for spreading invasive species.

## **5.8.3 Biological Resources Impact Summary**

Table 3-38 describes the context, intensity, and duration factors utilized in analysis for impacts to biological resources; based on these factors the Air Force has identified insignificant adverse impacts to the natural environment. In summary, there are unavoidable adverse impacts to biological resources from incidental disturbances associated with dismounted maneuvers and aircraft and AO. Direct unavoidable impacts have also been identified associated with increased wildfire potential resulting from training activities. The intensity of any of the identified impacts is minimized through implementation of General Operational Constraints identified in Section 2.5. The Air Force completed consultation with USFWS in accordance with Section 7 of the ESA on April 8, 2014, and has received concurrence on a finding of "Not Likely to Adversely Affect" sensitive species or habitat (USFWS, 2014). A copy of the Biological



Assessment and all associated correspondence is included in Appendix C, *Consultation Documentation*.

[Table 5-48](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-48. Proposed Action/Subalternative 1 Biological Resource Impacts Summary – BRSF**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Consumption activities would not occur. Impacts would otherwise generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				
Point impact					
Incidental surface disturbance					
Consumption					
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				
Dismounted maneuver					
Use of Expendables	At BRSF, noise-generating expendables would only be used at hardened camp sites.				
Blanks/GBS	<b>Proposed Action:</b> Potential disturbance from noise would be minimal, since noise-generating expendables would only be used at hardened camp sites. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. Increased potential for wildfire is considered an unavoidable, potentially adverse impact that would persist over the long term. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to BRSF and Eglin AFB wildfire management practices, impacts would be minimized. <b>Subalternative 1:</b> Impacts would be the same as those described under the Proposed Action; noise generating expendables would be limited to hardened camp sites with minimal potential for impact as compared to the Proposed Action.				
Smoke grenades					

**Table 5-48. Proposed Action / Subalternative 1 Biological Resource Impacts Summary – BRSF, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
					practices. <b>Subalternative 1:</b> Impacts would be the same as those described under the Proposed Action; noise generating expendables would be limited to hardened camp sites with minimal potential for impact as compared to the Proposed Action.
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				
Aircraft Operations	<b>Proposed Action:</b> Potential short-term and intermittent noise disturbance to general wildlife species. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term allowing species to resume normal activities. Known protected species locations would be protected and not used as LZs/DZs. <b>Subalternative 1:</b> Impacts would be the same as those described under the Proposed Action. Potential short-term and intermittent noise disturbance to general wildlife species would occur in areas surrounding 13 potential LZ/DZ sites (including Blackwater Airfield) located in TA-1, -2, -6, -7, and -9. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term allowing species to resume normal activities. Known protected species locations would be protected and not used as LZs/DZs.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.
Amphibious Operations	<b>Proposed Action:</b> Potential for incidental direct physical impact (boat strike) or incidental indirect impact (disturbance or harassment). However, while unavoidable, this potential is expected to be negligible given		Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. Given proposed frequency of operation and the		

**Table 5-48. Proposed Action/Subalternative 1 Biological Resource Impacts Summary – BRSF, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
	the proposed operational frequency and likelihood that any aquatic species would move from harm's way and/or return to the area once operations have ceased. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.		implementation of General Operational Constraints the potential for this occurrence is expected to be minimal. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.		
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				

AFB = Air Force Base; BRSF = Blackwater River State Forest; DZ = drop zone; GBS = ground burst simulator; LZ = landing zone; STOP = Short-Term Offender Program; TA = tactical area

#### 5.8.4 Proposed Resource-Specific Mitigations

No resource-specific mitigations have been identified outside of those requirements associated with the ESA Section 7 consultation for this action, as provided in Appendix C, *Consultation Documentation*. The consultation requirements have been incorporated into the Operational Constraints because they are required to be implemented as part of the Proposed Action/Subalternative 1.

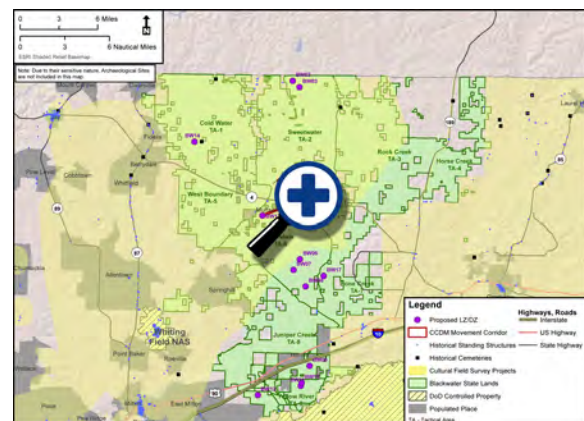
In addition to the general operation constraints identified in Section 2.5, those Resource-Specific Mitigations associated with earth resources (Section 3.6) and water quality (Section 3.7) are also applicable to the Proposed Action/ Subalternative 1.

### 5.9 CULTURAL RESOURCES

#### 5.9.1 Affected Environment

##### **Proposed Action/Subalternative 1 (Preferred Alternative)**

For cultural resources, the ROI for the Proposed Action is identical to that of Subalternative 1 in BRSF. Forty-four cultural resource studies were conducted between 1977 and 2012 in the nine BRSF training areas. According to records of the Florida Division of Historical Resources (DHR), many of the training areas have been surveyed to some extent for cultural resources (Figure 5-78). Many of these



**Figure 5-78. Cultural Resource Survey in BRSF**

surveys are either not up to current standards or were focused academic studies and are not comprehensive in nature (DHR, 2013). Appendix F, *Cultural Resources*, lists surveys conducted on BRSF.

Within BRSF, there are 196 archaeological sites ranging in age from twentieth century historic contexts to the Paleo-Indian period (10,000 years before Christ [B.C.]). Of these 196 sites, 111 (56.63 percent) are prehistoric, 29 (14.80 percent) are historic, and 2 (1.02 percent) are multicomponent historic and prehistoric. Due to insufficient information, the cultural or temporal affiliation of 54 sites (27.55 percent) cannot be determined. Most of the 196 sites have not been evaluated by either the principal investigator or the SHPO as to NRHP eligibility (DHR, 2013). Appendix F, *Cultural Resources*, lists sites considered potentially eligible along with those that remain unevaluated.

To date, two historic cemeteries have been identified on BRSF; both are located in Training Area 1. The Concord/Simmons Cemetery (8SR00891) was first established in 1888; it is no longer in use but is maintained by the state of Florida. This cemetery has not been evaluated for NRHP eligibility. The Sellersville Cemetery (8SR01216) is privately maintained and it is not known whether it currently is in use. This cemetery has not been evaluated for NRHP eligibility (DHR, 2013). Additional information on these cemeteries can be found in Appendix F, *Cultural Resources*.

One NRHP-eligible historic structure is located within the boundaries of BRSF. The Munson Lodge (8SR01029), a vernacular-style structure constructed in 1927, is located within TA-6 (DHR, 2013).

To date, no historic districts, TCPs, or SSs have been identified on BRSF (DHR, 2013).

Within the proposed movement corridor and LZ/DZ sites, most of these areas have not been surveyed for cultural resources or previous efforts are not up to state survey standards. The following table ([Table 5-49](#)) shows the status of surveys and known cultural resources within these Proposed Action/ Subalternative 1 locations.

**Table 5-49. Cultural Resource Status within BWSF LZ/DZ and Movement Corridors**

Area	Survey Status	Cultural Resources Identified
BW02	Inadequately Surveyed	LZ/DZ Overlaps Archaeological Site Buffer
BW03	Inadequately Surveyed	No Cultural Resources Identified to Date
BW06	Unsurveyed	No Cultural Resources Identified to Date
BW07	Unsurveyed	No Cultural Resources Identified to Date
BW08	Unsurveyed	No Cultural Resources Identified to Date
BW09	Unsurveyed	No Cultural Resources Identified to Date
BW10	Unsurveyed	No Cultural Resources Identified to Date
BW11	Unsurveyed	No Cultural Resources Identified to Date
BW12	Unsurveyed	No Cultural Resources Identified to Date
BW13	Inadequately Surveyed	No Cultural Resources Identified to Date
BW14	Inadequately Surveyed	No Cultural Resources Identified to Date
BW17	Unsurveyed	No Cultural Resources Identified to Date
Movement Corridor	Partially Surveyed	No Cultural Resources Identified to Date
Blackwater Airfield	Inadequately Surveyed	No Cultural Resources Identified to Date

\*Data from DHR, 2013

## 5.9.2 Environmental Consequences

### *Proposed Action/ Subalternative 1 (Preferred Alternative)*

Impacts are generally the same under both the Proposed Action and Subalternative 1, with less potential for impact under Subalternative 1 associated with the reduced scope of proposed activity. As discussed in Section 3.9, potential adverse impacts to cultural resources may occur from land disturbance activities, dismantled movements, and AO due to ground disturbance. Other Proposed Action effectors are not addressed in this section. Impacts to BRSF cultural resources identified in Section 5.9.1 would be the same as those described in Section 3.9, that is, potential disturbance or inadvertent discovery of previously unidentified cultural resources in both surveyed and unsurveyed areas. Ground-disturbing activities would be limited in unsurveyed areas, and known cultural resource locations would be avoided as part of general operations constraints (see Section 2.5). The Air Force has notified the ACHP, SHPO, Florida Forest Service and applicable Native American tribes about this Proposed Action. The Air Force and the Florida SHPO have signed a Programmatic Agreement in coordination with the five federally recognized tribes and Florida Forest Service to meet requirements under Section 106 of the NHPA. The final Programmatic Agreement and results of the consultation process are included in Appendix C of the Final EIS.

## 5.9.3 Cultural Resources Impact Summary

### *Proposed Action/ Subalternative 1 (Preferred Alternative)*

Table 3-41 describes the context, intensity, and duration factors utilized in analysis for impacts to cultural resources. Based on the 36 CFR Section 800.5 definitions of “adverse effect” and “no effect,” the Air Force has determined there is the potential for adverse effects to cultural resources. Implementation of the General Operational Constraints identified in Section 2.5 would minimize the potential for negative effects. In addition, units would have access to a database and maps that would provide spatial and textual information on restrictions associated with specific training areas. These tools would allow units quick access to information on avoidance areas, thus minimizing the potential for impacts to cultural resources.

Table 5-50 summarizes the impacts. Impacts are categorized as follows:

- Adverse (yellow)
- No effect (green)

**Table 5-50. Proposed Action/Subalternative 1 Cultural Resource Impacts Summary by TA-BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential exists to displace or destroy cultural resources in areas not previously surveyed or partially surveyed. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impact associated with the reduced level of proposed activities.								
Point impact									
Incidental surface disturbance									
Consumption									



**Table 5-50. Proposed Action/Subalternative 1 Cultural Resource Impacts Summary by TA-BRSF, Cont'd**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.								
Dismounted movement	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Dismounted movement will be restricted to LZs/DZs and a small corridor from Blackwater Airstrip to the STOP camp, lessening the potential for impacts. Additionally, there would be less frequency of activities overall, resulting in less impact.								
Use of Expendables	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.								
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.								
Amphibious Operations	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Amphibious operations would not occur, therefore the Air Force has not identified impacts to cultural resources under this subalternative.								
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.								

BRSF = Blackwater River State Forest; DZ = drop zone; LZ = landing zone; TA = tactical area

#### 5.9.4 Proposed Resource-Specific Mitigations

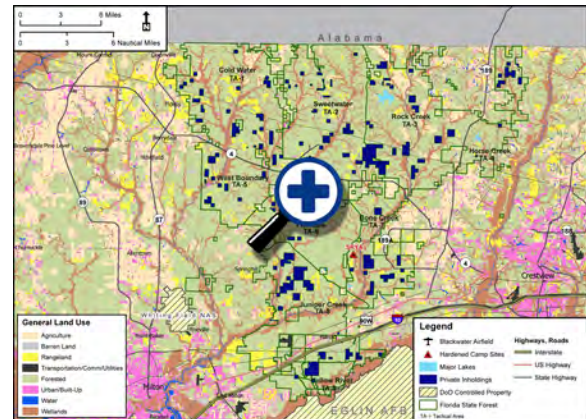
Resource-specific mitigations for cultural resources have been identified in the Final the *Programmatic Agreement Among Eglin Air Force Base and The Florida Historic Preservation Officer Regarding the Proposed Gulf Regional Airspace Strategic Landscape Initiative*. The PA identifies specific requirements associated with avoidance and/or minimization of potential impacts to cultural resources that would apply to both the Proposed Action and Subalternative 1. Such requirements (Located in stipulations, Section VI., Resolution of Adverse Effect) include; avoidance and preservation in place of resources, using flagging, signage, and temporary fencing or other such measures around the limits of property. When avoidance is not possible, Eglin AFB will notify the ACHP of an adverse effect finding and inform the ACHP that Eglin AFB will prepare a MOA with SHPO participation. Eglin will also consult the Tribes when developing this MOA if the adversely affected historic properties are TCPs or NRHP-eligible prehistoric sites, or eligible historic sites that are significant to the Tribes. More detailed information is provided in the Final signed Programmatic Agreement located in Appendix C, *Consultation Documentation*.

All General Operational Constraints (Section 2.5) identified previously would also serve to minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 5.10 LAND USE

### 5.10.1 Affected Environment

Existing and planned land uses at BRSF include agriculture, range land, transportation, communications, utilities, forested, urban/built up, water, and wetlands (FDEP, 2007b). [Figure 5-79](#) shows the land use types, private lands, and special use areas present at BRSF. [Table 5-51](#) lists the number, acreage, and percentage of the major land use types present in each TA at BRSF (TA-1 through TA-9). More detail regarding land use types and management practices at BRSF can be found in the *Ten-Year Resource Management Plan for Blackwater River State Forest* (FDACS 2013).



**Figure 5-79. Land Use Types at BRSF**

**Table 5-51. General Land Use Types Present in TAs at BRSF**

Tactical Area <sup>1</sup>	Land Use Type							
	Agriculture	Barren Land	Rangeland	Transportation/ Communications/ Utilities	Upland Forest	Urban/Built Up	Water	Wetlands
<b>TA-1</b>								
# Parcels	30	10	59	16	281	32	10	172
Acreage	98	16	2,108	203	22,980	44	75	7,772
% of TA	3	<1	6	<1	67	<1	<1	23
<b>TA-2</b>								
# Parcels	49	0	39	10	281	44	7	132
Acreage	498		1,154	88	27,195	141	139	6,463
% of TA	1		3	<1	77	<1	<1	18
<b>TA-3</b>								
# Parcels	78	3	25	7	243	43	11	155
Acreage	3,210	28	590	82	21,540	61	475	6,751
% of TA	10	<1	2	<1	66	<1	1	21
<b>TA-4</b>								
# Parcels	21	2	19	23	235	34	7	122
Acreage	42	2	97	82	8,727	49	69	2,417
% of TA	<1	<1	1	1	76	<1	1	21
<b>TA-5</b>								
# Parcels	55	21	41	6	125	22	2	189
Acreage	160	34	742	34	12,174	74	100	2,792
% of TA	1	<1	5	<1	76	<1	<1	17
<b>TA-6 (contains hardened camp site)</b>								
# Parcels	24	6	43	8	216	29	3	160
Acreage	25	3	782	51	19,829	39	43	3,494
% of TA	<1	<1	3	<1	82	<1	<1	14
<b>TA-7 (contains hardened camp site)</b>								
# Parcels	19	3	62	6	248	37	8	183

**Table 5-51. General Land Use Types Present in TAs at BRSF, Cont'd**

Tactical Area <sup>1</sup>	Land Use Type							
	Agriculture	Barren Land	Rangeland	Transportation/ Communications/ Utilities	Upland Forest	Urban/Built Up	Water	Wetlands
Acreage	105	9	885	42	10,873	34	156	4,024
% of TA	1	<1	5	<1	67	<1	<1	25
TA-8								
# Parcels	24	20	54	9	204	21	6	297
Acreage	9	25	2,058	151	15,492	33	180	4,417
% of TA	<1	<1	9	11	69	<1	1	20
TA-9								
# Parcels	14	2	16	8	153	25	3	143
Acreage	6	5	90	115	9,869	5	1	1,859
% of TA	<1	<1	1	1	83	<1	<1	16

TA = tactical area

Source: FDEP, 2007b

1. Percentages are approximate and rounded

### Recreational Opportunities

Several recreational areas are present at BRSF ([Table 5-52](#)). The major recreation areas include Bear Lake Recreation Area, Bone Creek Recreational Area, Camp Paquette, Coldwater Recreation Area, Hurricane Lake Recreation Area, Karick Lake Recreation Area, and the Krul Recreation Area. These recreation areas provide opportunities for camping swimming, picnicking, hiking, canoeing, fishing, horseback riding, and mountain biking as well as other activities permitted in Florida state forests.

**Table 5-52. Recreation Areas at BRSF**

TA	Major Recreational Areas and Features (Associated Uses)	Figure I.D.
TA-1	Camp Lowery Bridge (fishing/swimming/hiking)	10
TA-2	Camp Paquette (camping/picnicking/swimming/fishing/canoeing/hiking)	18
	Krul Recreation Area (swimming/hiking/camping/picnicking)	1
	Bear Lake Recreation Area (fishing/hiking/mountain biking/canoeing/picnicking/camping)	2
	Sweetwater Trail	13
	Bear Lake Loop Trail	16
	Bear Lake Jackson Connector Trail	17
TA-3	North and South Hurricane Lake Recreation Areas (fishing/hiking/camping/picnicking/canoeing)	3/4
	Kennedy Bridge (swimming/fishing/canoeing)	7
	Wiregrass Trail	15
TA-4	North and South Karick Lake Recreation Areas (hiking/canoeing/fishing/picnicking/camping)	5/6
	Jackson Trail	14
TA-5	Coldwater Recreation Area (horseback riding/canoeing/swimming/picnicking/camping)	19
TA-6	Juniper Bridge (swimming/fishing/canoeing)	11
	Red Rock Bridge (swimming/fishing/canoeing)	8
	Jackson Trail	14
TA-7	Bone Creek Recreation Area (picnicking/swimming/fishing/canoeing)	12
	Bryant Bridge (swimming/fishing/canoeing)	9
TA-8	Juniper Creek Trail	20
TA-9	Yellow River WMA	

Source: FDEP, 2007b

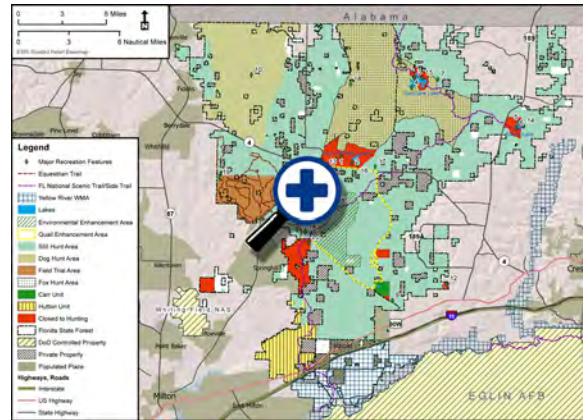
BRSF also contains the Blackwater WMA (including the Carr and Hutton Units) and a portion of the Yellow River WMA located south of I-10. These WMAs provide opportunities for hunting, horseback riding, wildlife viewing, cycling, canoeing, and fishing. Regulation summaries, hunting seasons, and area maps can be found on the FWC website (<http://myfwc.com/hunting/wma-brochures/>).

The number of recreational users for each recreational area and WMA is not available. However, for 2012-2013 there were approximately 190,000 visitors to BRSF (Ledew, 2013). [Figure 5-80](#) shows the specific location of the recreational and hunting areas within BRSF.

### ***Private and Adjacent Landowners***

Several private inholdings are surrounded by, or adjacent to, the TAs at BRSF.

Private parcels include private land owners, commercial businesses, and housing for on-site staff. [Figure 5-79](#) shows the locations of private parcels at BRSF. [Table 5-53](#) lists the number and acreage of private parcels associated with each TA (FDEP, 2007b).



**Figure 5-80. BRSF Recreation and Hunting Areas**

**Table 5-53. Private Parcels Present at BRSF**

Tactical Area (TA)	Name	Private Inholdings (Within Overall BRSF Perimeter)		# Private Holdings Adjacent to BRSF/TA Perimeter
		Quantity	Acreage	
1	Coldwater	138	2,298	138
2	Sweetwater	94	1,624	75
3	Rock Creek	106	2,087	174
4	Horse Creek	44	578	175
5	West Boundary	157	1,231	82
6	Floridale	112	1,574	86
7	Bone Creek	120	2,569	196
8	Juniper Creek	138	2,036	174
9	Yellow River	390	1,974	141

BRSF = Blackwater River State Forest; TA = tactical area

Source: FDEP, 2007b

## **5.10.2 Environmental Consequences**

### ***Proposed Action***

Potential adverse impacts to land use may occur from noise resulting from the use of expendables and training activities involving aircraft operations and landing/drop activities. Potential interactions between recreational users, hunters, and military personnel engaged in training activities (e.g., CCDMs, roadway vehicle use, blackout driving) are discussed in [Section 3.10](#). Other proposed action effectors are not addressed in this section.

As described previously, the FFS requires that training activities avoid hunting seasons in order to minimize adverse impacts to hunters. The following is an example of when military training activities could occur based on the current 2014-2015 hunting season regulations for the Blackwater WMA. The regulation summaries, hunting seasons, and area maps for each WMA can be found on the FWC website (<http://myfwc.com/hunting/wma-brochures/>). Fishing is also allowed year-round within the WMAs but should not be adversely impacted by training activities including amphibious operations. Migratory bird hunting is also allowed. Since the specific seasons for migratory bird hunting are set by the USFWS, this would be part of the ongoing coordination between the Air Force and USFWS. Again, the below hunting seasons are for 2014-2015 and provided only as an example; these hunting season constraints would be revised annually in coordination with the FFS, FWC, and USFWS.

### **Blackwater WMA**

Training activities could occur in the designated Still Hunt Area (including the Dog Hunt Area and Quail Enhancement Area unless otherwise noted) during the following times for the 2014-2015 hunting season:

#### ***Day or Night Training***

- March 2–13, 16–20
- April 27–30
- May 4–14, 18–31
- June 1, 4, 8–18, 22–30
- July 1–2, 6–16, 20–31
- August 1–31
- September 1–30
- October 1–24

#### ***Night Training Only (two hours after sunset, two hours before sunrise)***

- January 1–31 (except Dog Hunt Area)
- February 1–28 (except Dog Hunt Area)
- April 1–27
- October 25–31
- November 1–26, 27–30 (except Dog Hunt Area)
- December 1–19, 20–31 (except Dog Hunt Area)

Per operational constraints identified in Section 2.5, training in the Field Trial Area, Fox Hunt Area (which includes LZs/DZs BW-2 and BW-3), Carr Unit, and Hutton Unit would be limited because of their size and the types/frequency of hunting activities that occur; training in these areas would be conducted according to FFS approval. No training activities would be allowed along the FNST.



Additionally, the overflight restrictions of the TA-5 area and the training restrictions associated with the FNST (as discussed in Section [2.5](#)) would serve to minimize potential adverse impacts to recreational users.

### ***Subalternative 1 (Preferred Alternative)***

Impacts would generally be the same as described under the Proposed Action. None of the proposed LZs/DZs fall within the Field Trial Area, Fox Hunt Area, Carr Unit, or Hutton Unit. The potential for interaction with recreational users would be diminished associated with the site-specific training proposed, as well as the reduced types, frequency, and duration of activities proposed.

## **5.10.3 Land Use Impact Summary**

### ***Proposed Action***

[Table 3-45](#) describes the context, intensity, and duration factors utilized in analysis for impacts to land use; based on these factors the Air Force has identified insignificant land use impacts to public health and safety and the human environment. Temporary annoyance to recreational users from noise during training activities (see Noise Sections [3.3](#) and [5.3](#)) is unavoidable. Impacts to other recreational users and adjacent landowners would be minimized through implementation of operational constraints identified in Section [2.5](#), and avoidance of noise-sensitive areas (see [Figure 5-11](#) through [Figure 5-20](#)).

Noise-generating expendables (e.g., blanks) would only be used at the hardened camp sites (i.e., STOP Camp and SRYA).

The STOP Camp and SRYA site are currently not open to the public, and this would not change if the Air Force utilizes these locations. While the potential adverse impact on the quality of recreational experiences in these areas may be somewhat diminished, it would not preclude recreational use or cause general incompatibility, and impacts would be intermittent and short term.

Because Subalternative 1 identifies specific locations for training, as well as a reduced number of activities and associated frequency and duration, potential land use impacts (i.e., annoyance from noise to recreational users and landowners) would be greatly minimized. There would be no expendable use anywhere within BRSF except for the hardened camp sites. To minimize potential noise impacts from training activities involving aircraft operations and landing/drop activities, 13 LZ/DZ locations (including Blackwater Airfield) would be utilized (see Section [2.3.2.1](#)). Training activities utilizing aircraft operations (e.g., LLHI/E and airdrops) would only occur at the hardened camp site LZ/DZs and the Blackwater Airfield using designated fly zones and at less frequency than for the Proposed Action.

[Table 5-54](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-54. Proposed Action/Subalternative 1 Land Use Impacts Summary by TA – BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with the potential for impact being considerably less due to the reduced level of proposed activity.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with the potential for impact being considerably less due to the reduced level of proposed activity.								
Dismounted movement									
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> Noise-generating expendables (i.e., blanks) would only be used in the vicinity of hardened camp sites. Measures would be taken to minimize noise impacts (see <a href="#">Figure 5-11</a> through <a href="#">Figure 5-20</a> ), but occasional low-level temporary noise impacts to recreational users and adjacent landowners could occur. <b>Subalternative 1:</b> Impacts would genrally be the same as described under the Proposed Action.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> Although measures such as restrictions regarding the timing and location of aircraft operations (see <a href="#">Figure 5-11</a> through <a href="#">Figure 5-20</a> ) would minimize noise impacts to recreational users and adjacent landowners, occasional low-level temporary noise impacts could occur. <b>Subalternative 1:</b> Aircraft operations and landing/drop activities greatly reduced and would only occur at the identified LZ/DZs. Proposed use of the identified LZs/DZs would not result in any ladn use conflicts.								
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.								

BRSF = Blackwater River State Forest; GBS = ground burst simulator; TA = tactical area

#### 5.10.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for land use have been identified as a result of analyses in this chapter.

### 5.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

#### 5.11.1 Affected Environment

##### *Proposed Action and Subalternative 1 (Preferred Alternative)*

The main concerns regarding socioeconomics and environmental justice include noise, safety, and disturbance associated with the military land and air training that could potentially impact property values, economic activity, recreation and tourism, quality of life and health of the communities, and environmental justice-related populations. Socioeconomic resources associated with the BRSF are concentrated in Santa Rosa County and Okaloosa County, Florida, which constitute the ROI for the analysis.

## Property Values

[Table 5-53](#) in Section [5.10](#), Land Use, provides the number and acreage of private parcels associated with each tactical area (TA) at BRSF. The estimated number of total housing units and the median home value in Okaloosa and Santa Rosa Counties is shown in [Table 5-55](#) (U.S. Census Bureau, 2013b). Between 2009 and 2013, both counties experienced an annual decline in the median home value and an overall decline of approximately 11 percent during this time.

**Table 5-55. Selected Housing Characteristics in the ROI – BRSF**

Location	5-Year Estimates				
	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
<b>Okaloosa County</b>					
Total Housing Units	91,943	91,624	92,095	92,577	92,965
Median (dollars)	\$205,600	\$204,400	\$196,800	\$188,200	\$182,100
<b>Santa Rosa County</b>					
Total Housing Units	58,774	63,059	64,066	64,707	65,231
Median (dollars)	\$183,000	\$182,300	\$173,400	\$166,300	162,300

Source: U.S. Census Bureau, 2013b

It is generally acknowledged that even during tight economic conditions, a relatively higher premium is placed on properties with access to nature (USEPA, 2012). These premiums placed on properties near natural areas vary according to site-specific characteristics. Several undeveloped acreage properties in Santa Rosa County surrounded by the BRSF with access to nature areas, trails, and other outdoor recreational opportunities range in value between \$4,000 and \$5,000 per acre. These estimates were based on the current asking sale price and the number of acres for various properties listed for sale in the area (Land of America.com, 2014).

## Economic Activity

The local economies of Santa Rosa County and Okaloosa County are enhanced through revenue producing activities available on the state forest (FFS, 2013). The major revenue generating activities on BRSF include timber revenue from traditional sales of roundwood logs and receipts from improved recreation areas.

Timber revenues during the period 2003–2009 have varied greatly and reached a high of over \$6.5 million in revenue during FY2004-2005 following a large salvage sale due to Hurricane Ivan. Timber revenues reached a low of \$84,000 the following year as harvesting plans were revised. Revenue for the past six years has averaged approximately \$1.92 million and expected to continue at a similar pace for the next ten years (FFS, 2013).

Revenues from recreational fees have gradually increased over the past several years and are expected to continue to increase. In FY 2010-2011, the total revenues from recreation fees were \$332,924. The majority of revenues generated were from camping fees (73 percent), followed by entrance fees (14 percent), stable fees (7 percent), commercial permits (4 percent), kitchen and pavilion rentals (2 percent), annual pass sales (1 percent) and canoe rentals (less than 0.4 percent) (FFS, 2013).

Revenue generating activities help to offset the costs of management and operational costs. The most recent annual budget for the Blackwater Forestry Center (BFC) totaled \$1,152,607 for FY 2013- 2014. The BFC is headquartered within BRSF and is responsible for Escambia, Santa Rosa, and Okaloosa Counties (FFS, 2013).

Other activities on the state forest that provide for multiple-use and have generated revenue or have the potential to generate revenue includes: biomass fuelwood sales, pine seed and decorative cone sales, lightwood sales, firewood, gas and oil exploration/leases, cattle grazing, and United States military uses (FFS, 2013).

### Recreation and Tourism

Over the last five years, the second largest industry in Okaloosa County and Santa Rosa County, in terms of employment was retail trade following the government and government enterprises industry (BEA, 2014). The retail trade industry combined with the arts, entertainment, and recreation industry and the accommodation and food services industry could collectively be considered jobs related to the tourism industry. These industries combined suggest that tourism accounts for approximately 22 percent to 24 percent of total employment in each county annually (see [Table 5-56](#)). The Okaloosa Economic Development Council (EDC) has estimated that every dollar spent in Okaloosa County on tourism goes through the local economy 1.8 times (Okaloosa EDC, 2014).

**Table 5-56. Employment by Industry, 2008–2012**

Description	Year				
	2008	2009	2010	2011	2012
<b>Okaloosa County</b>					
Total County Employment	125,095	121,682	119,024	121,925	124,727
Retail Trade	13,855	13,696	12,484	13,261	13,225
Arts, entertainment, and recreation	2,092	2,300	2,252	2,379	2,416
Accommodation and Food Services	11,968	11,484	11,153	11,909	12,329
<b>Total Tourism Industry</b>	<b>27,915</b>	<b>27,480</b>	<b>25,889</b>	<b>27,549</b>	<b>27,970</b>
<b>Santa Rosa County</b>					
Total County Employment	49,654	48,692	48,624	50,822	52,017
Retail Trade	6,478	6,238	6,237	6,561	6,643
Arts, entertainment, and recreation	1,070	1,031	1,113	1,195	1,152
Accommodation and Food Services	3,674	3,923	3,964	4,298	4,690
<b>Total Tourism Industry</b>	<b>11,222</b>	<b>11,192</b>	<b>11,314</b>	<b>12,054</b>	<b>12,485</b>

Source: BEA, 2014

The fastest segment of tourism is nature tourism or “ecotourism.” The Nature Conservancy has adopted the definition of ecotourism from the World Conservation Union as, “environmentally responsible travel to natural areas, in order to enjoy and appreciate nature (and accompanying cultural features, both past and present) that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples” (The Nature Conservancy, 2014). The BRSF attracts many recreational users, particularly canoers and kayakers and is often referred to as the “canoe capital of the world” and the center of ecotourism in the region

(City of Milton, 2014). More information regarding recreational use at BRSF is provided in Land Use Sections [3.10](#) and [5.10](#).

While it is evident that recreation provides economic value to the area, the full recreation value of natural resource systems and the characteristics of these resource systems are incomplete because market data does not provide the total value of natural resource systems. Several methods of analysis exist that attempt to estimate the value of natural resource systems and changes in the quality of recreation sites or natural resource systems. One such method is the travel cost method (TCM), a survey-based method which recognizes the value individuals place on a recreation site from the costs they incur to visit the sites. There are no known studies that have attempted to estimate the full economic value of the BRFS to Santa Rosa and Okaloosa Counties.

### Quality of Life and Health

The Behavioral Risk Factor Surveillance Survey (BRFSS), a statewide telephone survey of Florida adults, conducted by the Florida Department of Health provides information on the health of residents in each county and quality of life, defined as the, “perceived physical and mental health that impacts overall health status” (FDH, 2011). [Table 5-57](#) provides several quality of life and health statistics for Okaloosa and Santa Rosa Counties (FDH, 2010). Overall, both counties had a higher percentage of adults with good to excellent overall health as compared to the state in 2010. However, both counties experienced a decline in the percentage of adults with good physical and mental health in 2010 from the 2007 survey. The survey also revealed that the residents in Santa Rosa and Okaloosa Counties have a perceived high quality of life (FDH, 2010). While the perceived quality of life has increased in Okaloosa County between 2007 and 2010, it has declined in Santa Rosa County.

**Table 5-57. Quality of Life and Health Status, Okaloosa and Santa Rosa Counties**

Description	Okaloosa		Santa Rosa		Florida
	2007	2010	2007	2010	2010
Percentage of adults with good to excellent overall health	85.9	88.5	86.0	83.7	82.9
Percentage of adults with good physical health	90.5	89.6	89.4	85.8	87.4
Percentage of adults with good mental health	92.3	87.9	91.1	89.0	88.2
Percentage of adults who are “very satisfied” or “satisfied” with their lives	93.9	95.0	97.8	96.8	93.1
Percentage of adults who always or usually receive the social and emotional support they need	86.2	83.0	86.9	85.0	79.5
Average number of days where poor mental or physical health interfered with activities of daily living in the past 30 days	3.9	4.0	4.1	4.2	5.2
Average number of unhealthy physical days in the past 30 days	3.0	3.6	3.4	4.4	4.1
Average number of unhealthy mental days in the past 30 days	2.6	3.5	3.0	3.5	3.8

Source: FDH, 2010



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to BRSF socioeconomic and environmental justice resources identified in Section [5.11.1](#) would be the same as those described in Section [3.11](#).

### Property Values

As discussed in Section 3.11, it is difficult to quantify the potential impact to property values due to the many variables involved. Private parcels are interspersed throughout the ROI. Based on the five-year estimates of the median housing value between 2009 and 2013, as shown in Table [Selected Housing Characteristics in the ROI, BRSF], it would be anticipated that the trend in housing values would continue in which there would be an annual decline in the median home value for properties in Okaloosa County or Santa Rosa County. However, there are many characteristics that influence the price of a home including location, size, year built, amenities, interest rates, and local economic conditions.

Many studies have reported a positive effect on sales prices of homes located near natural areas including parks and forest lands due to amenities such as convenient access to recreation and wildlife, fewer crowds, less noise, and less pollution. In addition, many studies have concluded that noise has a negative impact on property values. Certain UoEX and air operations have the potential to generate noise and wildfire risk which could impact property values adjacent to and nearby forest boundaries, although the extent of the impact would vary based on the characteristics identified previously. As a result, while there may be some effect to property values over time it would be difficult to correlate those changes to the Proposed Action. Implementation of General Operating Constraints outlined in Section [2.5](#) would restrict noise-intensive activities around NSAs such as residential parcels to minimize the potential impact to property values and the Air Force does not anticipate any significant impact to property values as a result of the Proposed Action.

With regards to wildfire, there is minimal risk as described in Section [3.4](#). The potential impact to property values would depend on the scope of the fire itself; a large wildfire that impacts private property would obviously have a direct effect on the property, with the extent of the effect directly correlating to the value of the property pre-fire. If a wildfire were to impact private property due to the activities associated with the Proposed Action, it would be anticipated that the housing market would be impacted immediately following the event but would eventually diminish over time. While the risk of wildfire is greater with the use of expendables during training, implementation of wildfire prevention requirements as identified in Section [3.4](#) would minimize potential wildfire occurrences at BRSF. Given this, the Air Force does not anticipate significant adverse impacts from wildfire based on the low potential for wildfires to a) occur, and b) directly impact private property.

### Economic Activity

The BRSF provides opportunities for multiple uses by different types of users. The various activities the forest supports provide revenue to the FFS and help offset the costs associated with managing the forests. Under the Proposed Action, the FFS would benefit from additional revenue generated from the permit/lease fee. The permit/lease fee has yet to be negotiated between the Air Force and the FFS. Potential economic benefits associated with the increased revenue to FFS from the Air Force lease would

likely be minor, and any localized spending of military during training activities is considered incidental and would not be significant. Implementation of General Operational Constraints identified in Section 2.5 would allow continued multiple uses with minimal impact to other revenue producing activities available on the state forest. Additional details on potential impacts to recreation and tourism under the Proposed Action are discussed in more detail below.

### **Recreation and Tourism**

Certain ground and air maneuver training activities have been identified as resulting in potentially adverse recreation and tourism impacts due to the noise associated with these activities because users could perceive noise as an adverse impact on the quality of the environment or outdoor experience. These impacts have been identified as adverse but not significant due to the assessment that these impacts are typically recoverable over the short-to-medium term when mitigations, required to minimize the level of impact or potential for impact, are implemented. However, in the event that a visitor does have an undesirable experience due to the Proposed Action, there would be potential for that visitor to not return to the area. If negative experiences associated with the Proposed Action become frequent and shared by an increasing number of visitors, the FFS, and potentially local businesses, could experience a loss of revenue and an associated potential reduction in employment related to the tourism industry from a decrease in the number of first time and repeat visitors. Implementation of General Operational Constraints identified in Section 2.5 would be anticipated to minimize the potential for significant impacts to local businesses by minimizing the potential for adverse experiences for recreational users.

### **Quality of Life and Health**

The term, “quality of life” refers to the degree of well-being felt by an individual or group and typically includes physical (i.e. health, diet, protection against pain and disease) and psychological (i.e. stress, worry, and emotional states) aspects (FWCC 2014). Since these aspects are highly subjective to the individual, it is difficult to measure directly. The BRFSS attempts to measure the quality of life for communities in the Florida counties by surveying individuals and gleaning their perceptions on their personal physical and mental health. The BRSFF results suggest that the majority of adults in Okaloosa County and Santa Rosa County are “very satisfied” or “satisfied” with their lives. The BRFSS correlates health to quality of life but does not explicitly consider the role that the environment and changes in the quality of the environment has on these metrics. For instance, there are many forest-derived human health benefits such as an improvement in air quality and a decrease in urban noise. It is assumed that a higher environmental quality positively influences mental and physical health and perceived quality of life since it offers a greater incentive for people to participate in outdoor recreation. Outdoor participants are more likely to perceive themselves as healthier than those that do not participate in outdoor recreation (Outdoor Foundation 2012).

Certain ground training activities and air operations would be anticipated to result in adverse impacts to recreational users from additional noise. While the impacts associated with the Proposed Action are considered adverse due to the potential

perception by an individual that the actions would result in a decrease in the quality of the recreational experience or a decrease in physical and emotional health, the training activities would not preclude recreational use or cause general incompatibility, and impacts would be short term. General Operational Constraints outlined in Section [2.5](#) would be implemented to prevent access restrictions and minimize impacts on the quality of the natural environment which in turn would be anticipated to minimize impacts on the mental and physical health and perceived quality of life of recreational users. Therefore the Air Force does not anticipate significant adverse impacts to quality of life and health from use of the forest for training activities.

### **Environmental Justice and Special Risks to Children**

Environmental justice impacts and special risks to children may result from noise, safety, and land use impacts as described in Sections [3.3](#) (Noise), [3.4](#) (Safety), and [3.10](#) (Land Use). General Operational Constraints outlined in Section [2.5](#) would be implemented to avoid noise-sensitive areas, defined as campgrounds, privately owned parcels with at least one residential structure, hiking, horseback riding trails and stables. Under these conditions, no disproportionate impacts to minority, low-income, or youth populations have been identified from UoEX and air operations.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, the potential impacts to socioeconomic resources associated with noise and disturbance from ground movements and aircraft would be similar to those as described under the Proposed Action. Expendable use would be limited to the BRSF hardened camp sites (no expendables at THSF), BRSF ground movement would be limited to the movement corridor and LZs/DZs, and there would only be a few active LZs/DZs located in relatively remote locations. Furthermore, aircraft activities would occur on a less frequent basis. Consequently, while there is potential for adverse impacts, under Subalternative 1 would have a substantially lesser impact on socioeconomic resources than under the Proposed Action since there would be less frequent noise and potential interaction of military training with recreational users and private residents.

Similarly to the Proposed Action, no impacts have been identified under Subalternative 1 that would disproportionately impact environmental justice populations or pose special risks to children.

### **5.11.3 Socioeconomics/Environmental Justice Impact Summary**

Socioeconomic and environmental justice impacts are tied to those related to noise (Sections [3.3](#) and [5.3](#)), safety (Sections [3.4](#) and [5.4](#)) and land use (Sections [3.10](#) and [5.10](#)). [Table 3-48](#) describes the context, intensity, and duration factors utilized in analysis for socioeconomic and environmental justice impacts; based on these factors the Air Force has identified insignificant impacts to these resource areas and public health and safety and the human environment in general.

[Table 5-59](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 5-59. Proposed Action/Subalternative 1 Socioeconomics/Environmental Justice Impacts Summary – BRSF**

Effector	Tactical Area								
	1	2	3	4	5	6	7	8	9
Land Disturbance									
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to socioeconomic or disproportionate impacts to environmental justice areas with these activities (see Section 3.11). <b>Subalternative 1:</b> Same as Proposed Action.								
Point impact									
Incidental surface disturbance									
Consumption									
Ground Movement									
Wheeled vehicles	<b>Proposed Action:</b> Minimal to no noise and safety impacts have been identified that would effect transient users or residences that would impact socioeconomic resources and minority, low-income, or youth populations. Ground movements would avoid inhabited recreational sites and private property. The Air Force has not identified any adverse impacts to socioeconomic resources or disproportionate impacts to environmental justice areas of concern associated with these activities. <b>Subalternative 1:</b> Same as Proposed Action. The potential for impacts would be less under Subalternative 1 due to the limited dismounted movement activities at BRSF (restricted to the Movement Corridor).								
Dismounted movement									
Use of Expendables									
Blanks/GBS	<b>Proposed Action:</b> Potential adverse impacts to socioeconomic resources and environmental justice populations associated with increased wildfire potential and noise. Impacts would be mitigated through implementation of General Operational Constraints identified in Section 2.5, as well as Proposed Resource-Specific Mitigations described in Sections 3.3/5.3 (Noise) and Sections 3.4/5.4 (Safety). Such mitigations include avoidance of noise-sensitive areas and adherence to wildfire management requirements. <b>Subalternative 1:</b> The potential for wildfire would also be substantially less given restriced expendable use. Noise impacts from expendable use would be limited to the BRSF hardened camp site areas, having minimal-to-no effect on recreationalists or private property owners. As a result, the Air Force does not consider these impact potentials to be significant.								
Smoke grenades									
Other/equipment									
Aircraft Operations	<b>Proposed Action:</b> Potential non-sgnicificant adverse impacts to socioeconomic resources and environmental justice populations associated with noise from aircraft operations (see Sections 3.3 and 5.3, Noise). Impacts would be mitigated through operational constraints described in Section 2.5 and Proposed Resource-Specific Mitigations described in Section 5.3, Noise), such as use of avoidance areas and other flight constraints. <b>Subalternative 1:</b> Noise impacts from aircrft operations would be similar to those under the Proposed Action, although on a much lesser, more site-specific scale. All proposed LZs/DZs are outside the buffers established to minimize adverse noise impacts to private property owners and established recreational sites. While annoyance to some residences and transient recreationalists due to overflights cannot be avoided, the Air Force does expect these impact potentials to result in significant adverse socioeconomic impacts.								
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to socioeconomic resources or disproportionate impacts to environmental justice populations with these activities (see Section 3.11). <b>Subalternative 1:</b> This action would not take place. There would be no impacts to socioeconomic resources or disproportionate impacts to minoriy, low-income, or youth populations.								



#### 5.11.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for socioeconomics and environmental justice have been identified as a result of analyses in this chapter beyond proposed mitigations described in Sections [3.4.3](#) and [5.3.4](#).

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### 5.12 SOLID AND HAZARDOUS MATERIALS/WASTE

#### 5.12.1 Affected Environment

##### **Proposed Action/Subalternative 1 (Preferred Alternative)**

No hazardous materials or hazardous or petroleum wastes would be generated at most BRSF sites, because no industrial activities would occur at these sites. The only exceptions are the Molino, Youngstown, and White City sites. At these locations, personnel would perform limited maintenance of vehicles and equipment, primarily consisting of oil and fluid changes. Consequently, hazardous materials stored at these sites include small quantities (55-gallon containers or smaller) of lubricating oil, hydraulic fluid, antifreeze, solvents, and paints. Wastes generated would include waste and solvents. All materials and wastes would be managed according to established FFS requirements. These requirements include the use of secondary containment and the availability of spill response equipment.

Additionally, the affected environment would comprise FFS requirements regarding the use and management of hazardous materials and wastes.

#### 5.12.2 Environmental Consequences

##### **Proposed Action / Subalternative 1 (Preferred Alternative)**

As discussed in Section [3.12.3](#), no adverse impacts to public health and safety and the human and natural environment associated with solid and hazardous material or waste would occur from training activities and this resource area is not discussed in detail in this section.

All activities would comply with applicable federal, state, and local regulations. During training, all appropriate steps would be taken to minimize potential impacts from debris/residue. For example, all solid waste generated would be collected and disposed. All metallic debris (e.g., brass cases) from training operations would be collected and recycled and, therefore, not disposed of as solid waste. The following would also be prohibited as part of training: throwing smokes, flares, or simulators directly into a water body; abandoning, dumping, burying, or otherwise concealing munitions, pyrotechnics, or residue, including packing materials, and releasing chemicals or metals (including brass) into streams, wetlands, or water bodies. The *Eglin AFB Interstitial Area Final Programmatic Environmental Assessment* (U.S. Air Force, 1998c) analyzed the environmental impact of increasing yearly ground troop movement in interstitial spaces from 55,800 troops per year (1997) to 167,500, equal to a 200 percent increase. No

adverse environmental impacts associated with chemical releases or solid/hazardous waste were determined from the 200 percent increase in ground troops regarding debris and the use of blanks, smokes, and flares during ground troop training activities in Eglin AFB training areas. The *Eglin AFB Interstitial Area Final Range Environmental Assessment, Revision 1* (U.S. Air Force, 2009), documented chemical releases from the munitions of the same quantity and types as are associated with the current Proposed Action and found no significant adverse impacts. Consequently, no significant adverse impacts are anticipated with the release of chemicals under the Proposed Action or Subalternative 1.

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## 5.13 INFRASTRUCTURE AND TRANSPORTATION

### 5.13.1 Affected Environment

Based on the limited interaction between training activities and utilities and transportation resources, discussion of the affected environment for infrastructure at BRSF is general in nature. The affected environment is basically the same for the Proposed Action and Subalternative 1.

#### 5.13.1.1 Utilities

Due to the size of BRSF and the existence of a significant acreage of private inholdings, numerous utility corridors (i.e., power lines, gas pipelines) are found within the Forest (BRSF, 2013). Additionally, most of the developed recreation area campsites have electricity, water, and flush toilets. The STOP Camp and SRYA sites also have available electricity, water, and natural gas. Wastewater at these sites is handled via septic tank.

#### 5.13.1.2 Transportation

The local and regional road network between Eglin AFB/Hurlburt Field and the BRSF is well developed. The key transportation routes include State Road (SR) 85, U.S. Highway (US) 90, and SR 4. From Eglin AFB, SR 85 is a four-lane route north to Crestview where it intersects US 90. From Crestview west, US 90 is a four-lane divided route that transitions to two lanes just east of the Yellow River. SR 4 intersects with US 90 just west of the Yellow River and is a two-lane road that cuts through the middle of BRSF. PJ Adams Parkway/Antioch Road is available as a by-pass around downtown Crestview, running from SR 85 to US 90. Numerous developed and undeveloped roads are located within BRSF.

### 5.13.2 Environmental Consequences

As discussed in Section [3.13.2](#), no adverse impacts to public health and safety or the human and natural environment associated with utilities usage or use of transportation resources would occur from training activities under the Proposed Action or

Subalternative 1. All activities would comply with applicable federal, state, and local regulations. As a result, this resource area is not discussed further in this chapter.

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## 5.14 BLACKWATER RIVER STATE FOREST IMPACT SUMMARY

[Table 5-60](#) provides a summary of impact determinations associated with training activities, for potentially affected resources based on analyses presented in Chapter [3](#), Sections [3.2](#) through [3.13](#), and Chapter 5, Sections [5.2](#) through [5.13](#). A “dot” in a cell indicates an interaction between the training activity and the respective resource. Impacts are categorized as follows:

- Adverse (yellow) – Potential impact to public health and safety, the human and natural environment, and/or potential violation of federal, state, or local regulations
- Neutral/no effect (green)

Adverse, insignificant impacts have been identified for the Proposed Action and Subalternative 1 and are described in detail in the respective resource area chapters. Overall, while impact types are generally the same between the Proposed Action and Subalternative 1, in all cases the potential impact level would be much less under Subalternative 1 given the reduced scope of activity, including limited aircraft operations, no expendable use, no amphibious operations, and elimination of other activities as shown in [Table 5-60](#).

The analyses in these sections were conducted based on effectors associated with training activities (as identified in [Table 3-1](#) in and their impacts on receptors identified in [Table 3-2](#) in Chapter [3](#), the impact summary provided in [Table 5-60](#) ties those two tables together and identifies the degree of impact to affected resources associated with specific training activities as described in Section [2.3.2](#). This allows the reader to understand the potential impacts associated with specific training activities.

Proposed Resource-Specific Mitigations applicable to both BRSF and THSF resulting from general analysis were previously identified in Section [3.14.1](#). Additional Proposed Resource-Specific Mitigations identified through analysis in this chapter are provided in Section [5.14.1](#) that would serve to further minimize or avoid any identified adverse impacts.

**Table 5-60. BRSF Proposed Action/Subalternative 1 Impacts Summary**

Training Activity Component	Resource Area Potentially Affected											
	Airspace (3.2/5.2)	Noise (3.3/5.3)	Safety (3.4/5.4)	Air Quality (3.5/5.5)	Earth Resources (3.6/5.6)	Water Resources (3.7/5.7)	Biological Resources (3.8/5.8)	Cultural Resources (3.9/5.9)	Land Use (3.10/5.10)	Socioeconomics/ Environmental Justice (3.11/5.11)	Haz/Solid Materials & Waste (3.12/5.12)	Infrastructure (3.13/5.13)
LZs/DZs												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1		•	•	•	•	•	•	•	•	•	•	•
Use of Expendables												
Proposed Action		•	•	•	•	•	•	•	•	•	•	
Subalternative 1		•	•	•	•	•	•	•	•	•	•	
LLH/E												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Temporary Combat Support Areas												
Proposed Action					•	•	•	•			•	
Subalternative 1					•	•	•	•			•	
Airdrops												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Air/Land Vertical Lift												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Cross Country Dismounted Movements												
Proposed Action					•	•	•	•	•	•	•	
Subalternative 1					•	•	•	•	•	•	•	
Roadway Vehicle Use												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1		•	•	•	•	•	•	•	•	•	•	•
Blackout Driving												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1	This activity would not occur.											
Emplacement of Obstacles												
Proposed Action					•		•	•	•		•	
Subalternative 1	This activity would not occur.											
Bivouacking/ Assembly Areas												
Proposed Action				•	•		•	•	•		•	

**Table 5-60. BRSF Proposed Action/Subalternative 1 Impacts Summary, Cont'd**

Training Activity Component	Resource Area Potentially Affected											
	Airspace (3.2/5.2)	Noise (3.3/5.3)	Safety (3.4/5.4)	Air Quality (3.5/5.5)	Earth Resources (3.6/5.6)	Water Resources (3.7/5.7)	Biological Resources (3.8/5.8)	Cultural Resources (3.9/5.9)	Land Use (3.10/5.10)	Socioeconomics/Environmental Justice (3.11/5.11)	Haz/Solid Materials & Waste (3.12/5.12)	Infrastructure (3.13/5.13)
Subalternative 1	This activity would no occur.											
Communications and Surveillance Operations												
Proposed Action				•	•		•	•	•		•	
Subalternative 1				•	•		•	•	•		•	
Amphibious Operations												
Proposed Action		•	•	•	•	•	•	•	•	•	•	
Subalternative 1	This activity would not occur.											
Natural Resource Consumption												
Proposed Action					•	•	•				•	
Subalternative 1	This activity would not occur.											
Overwater Hoist Operations												
Proposed Action	•	•	•	•		•	•		•	•	•	
Subalternative 1	•	•	•	•		•	•		•	•	•	
Opposing Forces Vehicle Operations												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Hardened Camp Site Use												
Proposed Action											•	•
Subalternative 1											•	•

DZ = drop zone; LZ = landing zone; LLHI/E = Low-Level Helicopter Insertions/Extractions

### 5.14.1 BRSF Proposed Resource-Specific Mitigations

Based on the scope of activities associated with the Proposed Action, the inherent General Operational Constraints identified in Section 2.5, and related impact analyses detailed in this EIS, the following Proposed Resource-Specific Mitigations have been identified to further minimize or avoid adverse impacts—in most cases impacts would be minimized such that impact levels would be reduced from “Adverse” (yellow) to “Neutral” or “No Effect” (green).

#### Noise

- A/LVL training aircraft inbound to and outbound from the Blackwater Airfield would avoid overflying privately owned parcels with residential structures where practicable.



- Approaches to and departures from Blackwater Airfield would be conducted from/to the north to avoid low overflight of a campground.
- Aircraft departing Blackwater Airfield would initiate takeoff roll from about the center point of the airstrip.
- LZ/DZ aircraft training (i.e., LLHI/E, AD, and A/LVL) would only be permitted in the northern half of Blackwater Airfield
- The Air Force would notify residents within 4,000 feet of the SRYA or former STOP Camp prior to use of munitions.

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## 6. TATE'S HELL STATE FOREST AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

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### 6.1 INTRODUCTION

This chapter addresses the receptors identified in Chapter [3](#) (the Affected Environment) specific to THSF and the impacts (the Environmental Consequences) on those receptors by the various effectors associated with the Proposed Action. As discussed in Chapter [3](#), Section [3.14](#), some resource areas would experience no interaction with this activity, or general impact analyses in Sections [3.2–3.13](#) have shown that there would be negligible or no impacts to a specified resource area, despite the site-specific nature of the resources. Additionally, in some cases the general analyses provided in Chapter [3](#) are sufficient to determine the extent of impacts on site-specific resources in that the general analysis is applied to the site-specific resources identified as the affected environment.

As noted in previous chapters, analyses rely heavily on previous NEPA documentation for similar activities within similar environments; these documents are incorporated by reference in certain sections where applicable, and are noted. Finally, the affected environment discussions provide information regarding the types of resources present; however, to avoid encyclopedic repetition of publicly available information the reader is directed to locations outside this document for such information should the reader desire it. As an example, the fact that sensitive species are present on THSF is addressed and types, quantities and locations (where applicable and allowed by law) are described. However, as discussion of each individual species in terms of physical description and foraging/reproductive aspects are encyclopedic and readily available from various sources, the reader is directed to a location (e.g., the USFWS or FNAI website) for this information. This is in keeping with 40 CFR requirements.

Training activity impact analyses consider the General Operational Constraints provided in Section [2.5](#). These are based on the establishment of the Protection Levels identified in [Table 2-21](#) as well as the noise protection levels resulting from impact analysis in Section [3.3](#) and presented in [Table 2-22](#). The following [Figure 6-1](#) through [Figure 6-11](#) provide graphical representation of the protection levels for ground operations at THSF as a whole, and for each individual tactical area. [Figure 6-12](#) through [Figure 6-22](#) provide similar information for noise-generating activities at THSF. Each map is a “clickable” thumbnail image that will provide full-screen viewing; each map is also available for full-page printing in Appendix A.

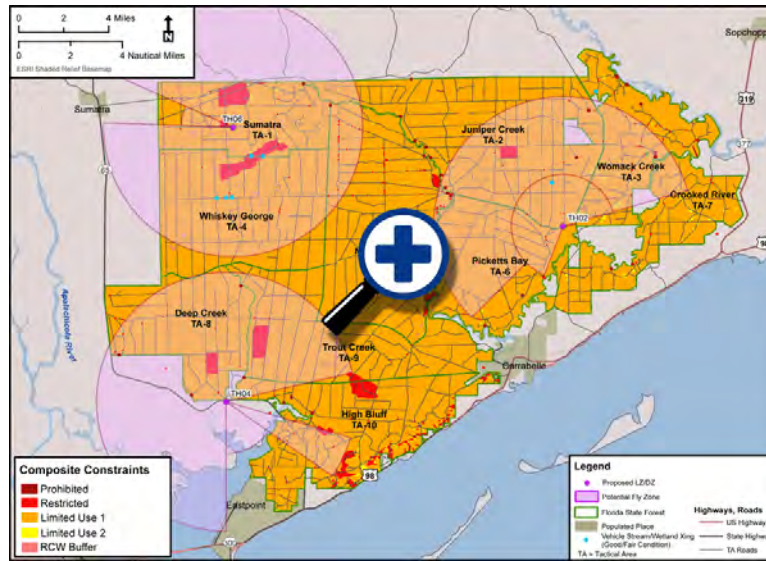


Figure 6-1. THSF Ground Operations Protection Levels

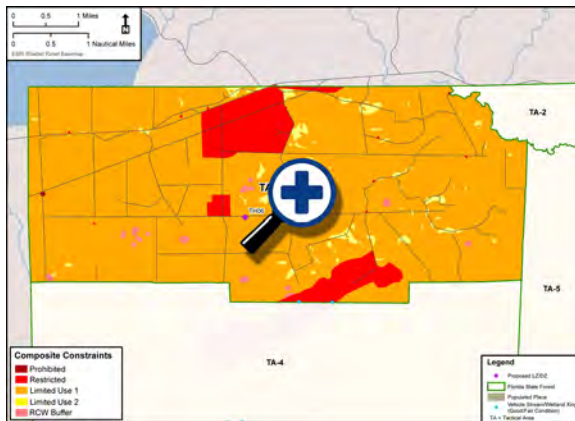


Figure 6-2. THSF TA-1 Ground Operations Protection Levels

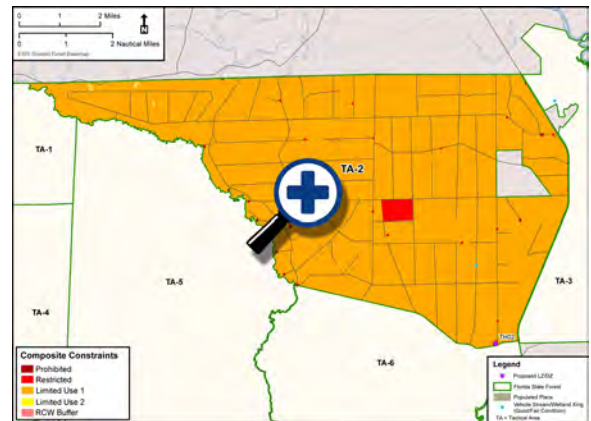


Figure 6-3. THSF TA-2 Ground Operations Protection Levels

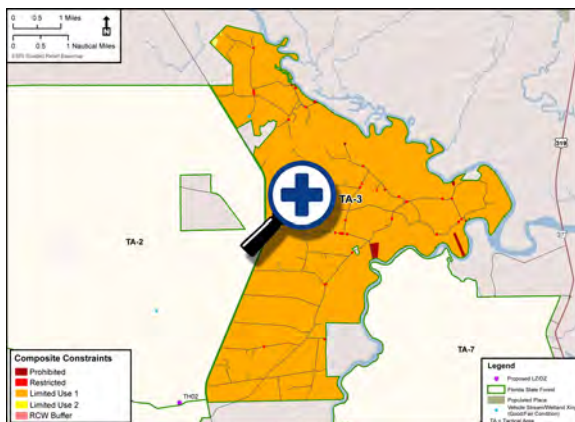


Figure 6-4. THSF TA-3 Ground Operations Protection Levels

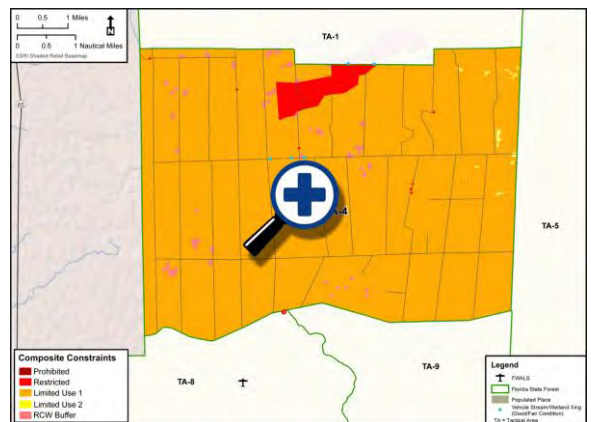
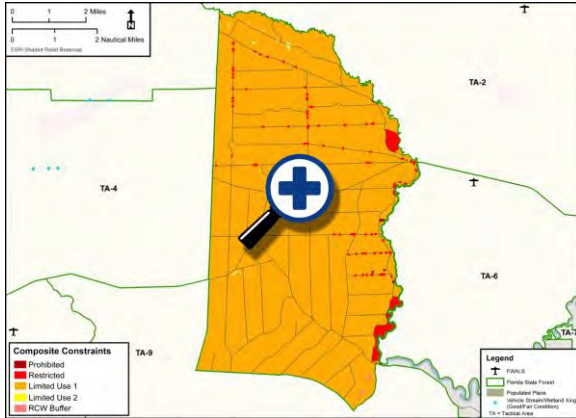


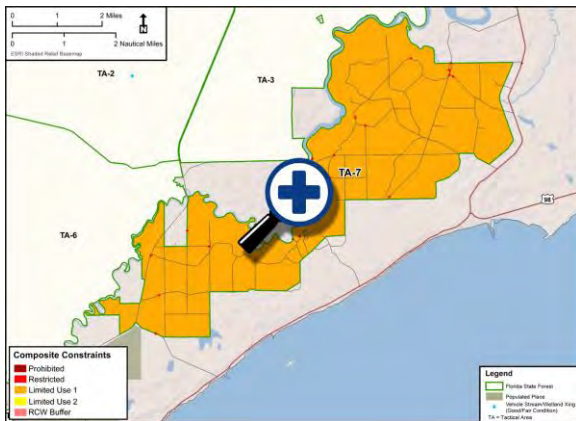
Figure 6-5. THSF TA-4 Ground Operations Protection Levels



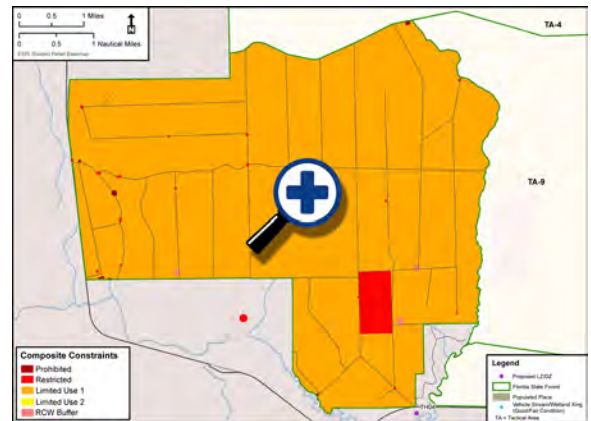
**Figure 6-6. THSF TA-5 Ground Operations Protection Levels**



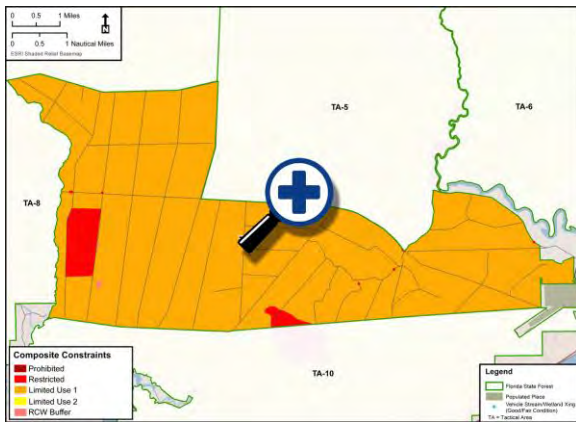
**Figure 6-7. THSF TA-6 Ground Operations Protection Levels**



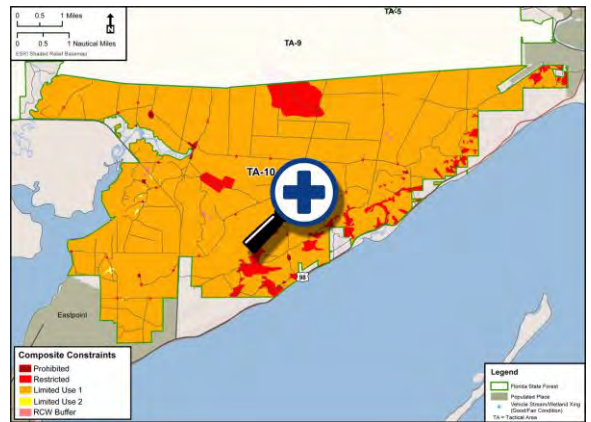
**Figure 6-8. THSF TA-7 Ground Operations Protection Levels**



**Figure 6-9. THSF TA-8 Ground Operations Protection Levels**



**Figure 6-10. THSF TA-9 Ground Operations Protection Levels**



**Figure 6-11. THSF TA-10 Ground Operations Protection Levels**



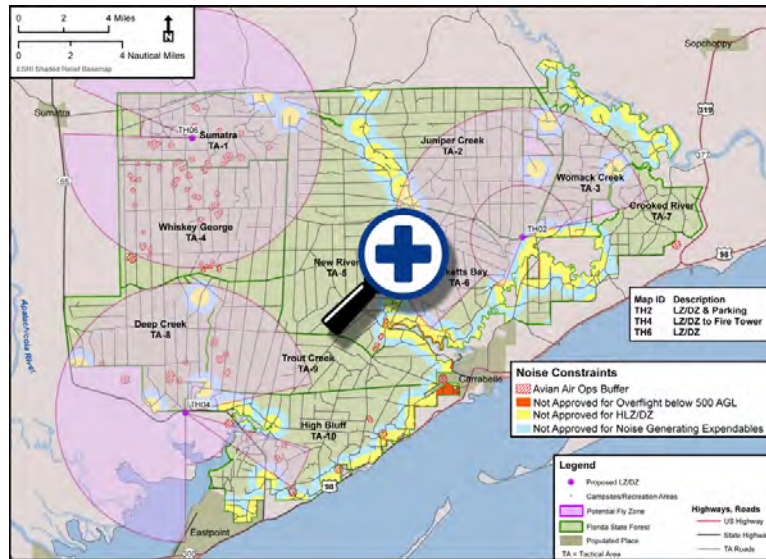


Figure 6-12. THSF Noise Protection Levels Overview

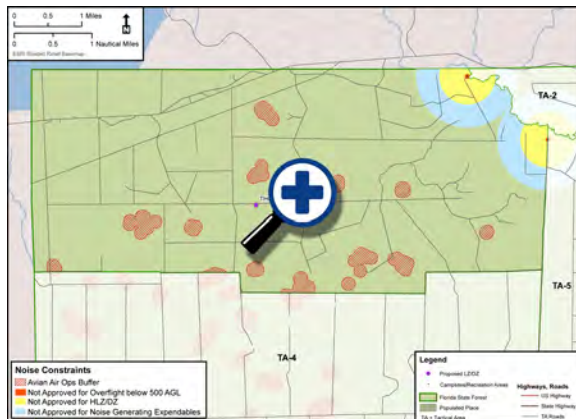


Figure 6-13. THSF TA-1 Noise Protection Levels



Figure 6-14. THSF TA-2 Noise Protection Levels

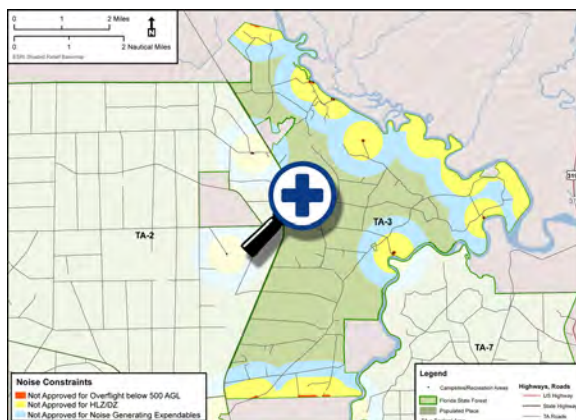


Figure 6-15. THSF TA-3 Noise Protection Levels



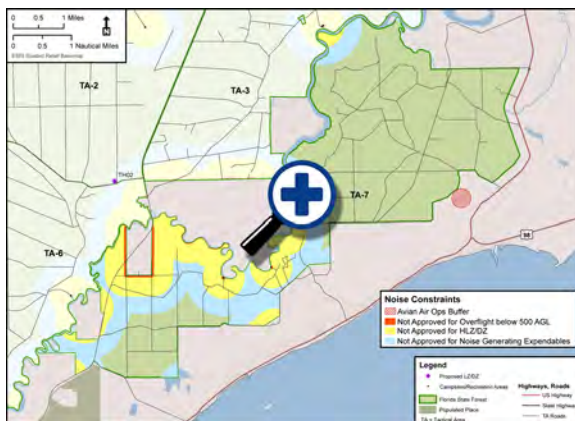
Figure 6-16. THSF TA-4 Noise Protection Levels



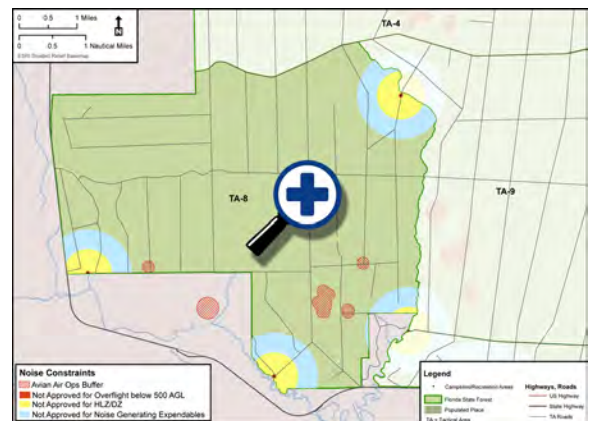
**Figure 6-17. THSF TA-5 Noise Protection Levels**



**Figure 6-18. THSF TA-6 Noise Protection Levels**



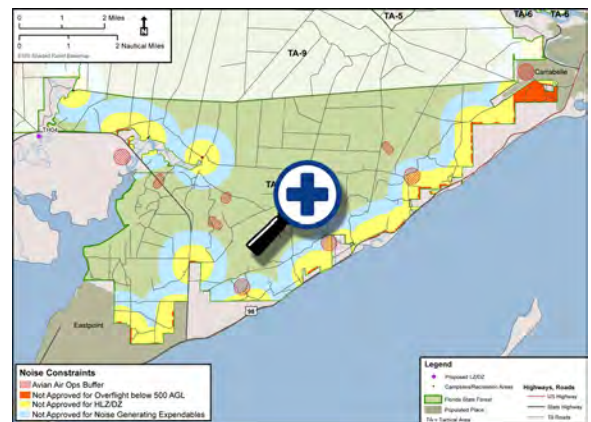
**Figure 6-19. THSF TA-7 Noise Protection Levels**



**Figure 6-20. THSF TA-8 Noise Protection Levels**



**Figure 6-21. THSF TA-9 Noise Protection Levels**



**Figure 6-22. THSF TA-10 Noise Protection Levels**



The surface area of THSF covered by the various protection levels per tactical area is provided in [Table 6-1](#).

**Table 6-1. THSF Protection Level Coverage**

Protection Level	Tactical Area										THSF Total
	1	2	3	4	5	6	7	8	9	10	
Ground Operations Protection Levels											
Prohibited											
Acres <sup>1</sup>	3	13	56	<1	12	20	<1	10	<1	62	176
% of Area <sup>1</sup>	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Restricted											
Acres <sup>1</sup>	1,255	253	0	598	326	8	0	307	715	1,472	4,934
% of Area <sup>1</sup>	8	<1		2	1	<1		2	3	6	2
RCW (200-foot buffer)											
Acres <sup>1</sup>	157	0		260	22	0		51	55	31	576
% of Area <sup>1</sup>	1			1	<1			<1	<1	<1	
LU-1											
Acres <sup>1</sup>	13,392	31,002	13,783	24,065	28,808	16,794	13,135	16,163	20,305	21,003	198,451
% of Area <sup>1</sup>	90	99	98	97	99	100	98	98	97	92	97
LU-2											
Acres <sup>1</sup>	176	58	166	117	30	35	193	48	5	347	1,176
% of Area <sup>1</sup>	1	<1	1	<1	<1	<1	1	<1	<1	2	<1
Noise Protection Levels											
Not Approved for Aircraft Overflights below 500 AGL											
Acres <sup>1</sup>	3	28	38	0	22	119	77	7	26	356	676
% of Area <sup>1</sup>	<1	<1	<1		<1	<1	<1	<1	<1	2	<1
Not Approved for LZs/DZs											
Acres <sup>1</sup>	333	2,221	2,840	0	2,180	2,284	2,107	635	890	3,808	17,299
% of Area <sup>1</sup>	2	7	20		7	14	16	4	4	17	8
Not Approved for Noise Generating Expendables											
Acres <sup>1</sup>	996	5,958	6,529	0	5,270	5,459	4,615	1,935	2,225	9,240	42,227
% of Area <sup>1</sup>	7	19	47		18	32	35	12	11	40	21
Avian Air Operations Buffer <sup>2</sup>											
Acres <sup>1</sup>	581	0		1,047	104	73	0	163	180	334	2,482
% of Area <sup>1</sup>	4			4	<1	<1		1	<1	1	1

AGL = above ground level; LU = Land Use; RCW = red-cockaded woodpecker; THSF = Tate's Hell State Forest

1. Acreages and percentages are rounded to the nearest whole number unless value is less than 1%, in which case value is indicated as <1%.

2. Represented by red hatched areas on [Figure 6-12](#) through [Figure 6-22](#).

## 6.2 AIRSPACE MANAGEMENT AND USE

### 6.2.1 Affected Environment

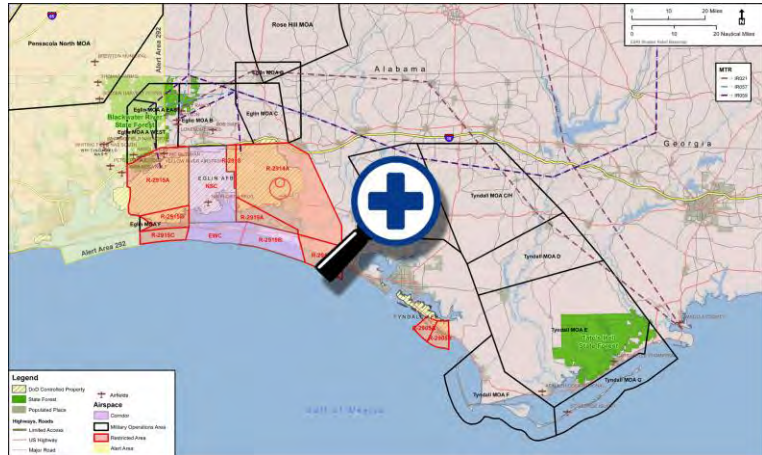
#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

Airspace over THSF is less heavily utilized than airspace over BRSF. As is the case with BRSF, Jacksonville ARTCC manages air traffic while en route and RAPCON/TRACON facilities take over management responsibility for aircraft in their

respective terminal areas. The areas affected by the Proposed Action and Subalternative 1 are the same.

### 6.2.1.1 Military Training Airspace

THSF underlies Tyndall E and G MOAs (see [Figure 6-23](#)). Tyndall E MOA has a floor altitude of 300 feet AGL while Tyndall G MOA has a floor altitude of 1,000 feet AGL. Both MOAs have a ceiling altitude up to but not including 18,000 feet MSL. MOA usage is intermittent between sunrise and sunset Monday through Friday. The Tyndall MOAs are expected to be used for approximately 5,000 sorties per year in calendar year 2014 (U.S. Air Force, 2011a). Both MOAs are managed by the 325 OSS/OSOS at Tyndall AFB, Florida.



**Figure 6-23. Special Use Airspace Units and Airfields**

### 6.2.1.2 Airfields and Transiting Aircraft

Airfields located in or near THSF are listed in [Table 6-2](#) with the approximate number of airfield operations flown per year currently. The locations of the airfields are shown in [Figure 6-23](#). Apalachicola, the busiest of the airports near THSF, supports 24,347 airfield operations per year. The other airports support fewer operations. Class E Airspace associated with Carrabelle Thompson Airport extends to 5 NM from the airport and to altitudes of 1,500 feet AGL. This airspace overlies a portion of THSF.

**Table 6-2. Airfields Near THSF**

Airfield Name	Approximate Annual Airfield Operations
Apalachicola Municipal Airport	24,375
Carrabelle-Thompson Airport	524
Saint George Island Airport	500
Wakulla County Airport	5,710

The FFS conducts aircraft operations over THSF as part of controlled burns, aerial surveys, and other operations. The frequency of these flights is variable from one season to the next depending on the number of prescribed burns conducted and other factors (Colburn, 2013). There are six helispots designated at THSF.

## 6.2.2 Environmental Consequences

### *Proposed Action and Subalternative 1 (Preferred Alternative)*

As discussed in Section [3.2](#), airspace management and use would only be potentially adversely affected by aircraft operations. Other Proposed Action/Subalternative 1 effectors are not addressed in this section. Impacts would generally be the same under the Proposed Action and Subalternative 1, with the potential for impacts less under

Subalternative 1 as a result of the proposed decrease in level of activity as compared to the Proposed Action.

Several of the GLI training event types would include or consist entirely of aircraft operations. As many as six sorties per annual average day under the Proposed Action or three sorties per annual average day under Subalternative 1 could be conducted over THSF. Under either action alternative, each sortie would include up to four aircraft. Section [2.3](#) describes types of GLI training events, including the expected frequency of occurrence. GLI training would operate in compliance with all federal aviation regulations and would not require segregation from nonparticipating aircraft. No new SUA or modifications to existing SUA would be required. Existing non-SUA airspace boundaries would not need to be altered to support proposed GLI training. Impacts of the Proposed Action and Subalternative 1 to Airspace Management and Use would be the same with the exception of Subalternative 1 including slightly fewer sorties per average annual day.

#### **6.2.2.1 Scheduling/Coordination**

THSF is overlain by Tyndall E and G MOAs. The floor altitude of Tyndall G MOA is 300 feet AGL, and GLI training would occur frequently above this altitude. Tyndall G MOA has a floor altitude of 1,000 feet AGL, and fewer GLI aircraft operations would be expected to require use of this airspace volume. Coordination with the 325 Operational Support Squadron, the agency managing the Tyndall MOAs, would be conducted prior to use of the MOAs when the MOAs are active. The MOAs are not active after sunset, which is when approximately 50 percent of GLI training would take place.

As discussed in Sections [1.3](#) and [1.4](#), scheduling concerns at the Eglin Range would be reduced as a result of the Proposed Action and Subalternative 1. This is because the Proposed Action and Subalternative 1 would allow nonhazardous training operations outside the Eglin Range.

A new process would be implemented by which the Air Force would coordinate GLI training missions with THSF to ensure de-confliction with forest activities. This coordination would be a new process.

#### **6.2.2.2 Efficiency of Ongoing Operations**

Tyndall MOAs are used much less frequently than other MOAs in the region (U.S. Air Force, 2011a). As mentioned previously, about 50 percent of GLI training is expected to take place after dark. The Tyndall MOAs are activated only intermittently between sunrise and sunset. An incremental increase in the usage rate of Tyndall E and G would not be expected to result in scheduling conflicts that would reduce the efficiency of ongoing operations.

GLI training would be conducted primarily in Class G uncontrolled airspace. All participating and nonparticipating aircraft would operate using see-and-avoid procedures. Any GLI aircraft operations entering Carrabelle Thompson Airport Class E airspace would not be expected to overwhelm the capacity of the airport, which currently conducts about 524 airfield operations annually (less than two per day).



Air Force staff would coordinate with THSF POCs to ensure that the efficiency of ongoing FFS would not be negatively affected by GLI training. So long as the coordination is carried out in accordance with the proposed agreement between the Air Force and FFS, no conflicts between the operations of the two organizations should occur.

### 6.2.3 Airspace Impact Summary

[Table 3-5](#) describes the context, intensity, and duration factors utilized in analysis for impacts to airspace; based on these factors the Air Force has identified insignificant adverse impacts to public safety and the human environment. Overall, impacts to airspace management would be moderate. Impacts would be regional, affecting Eglin Range as well as the airspace above THSF, and long term, with the increase in air traffic tempo lasting as long as GLI training continues. Impacts would include both positive impacts (i.e., reduced scheduling conflicts at Eglin Range) and negative impacts (i.e., increased air traffic in controlled and uncontrolled airspace over THSF). Although the number of sorties using Tyndall MOAs would be expected to increase, about 50 percent of GLI training operations would occur after sunset when the Tyndall MOAs are not active. Implementation of a coordination process between the Air Force and FFS would avoid potential operational conflicts that otherwise could have been considered severe impacts. Impacts to other ongoing operations would be expected to be minor as other operations could continue to transit the area normally while GLI training is under way.

[Table 6-3](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-3. Proposed Action/Subalternative 1 Airspace Impacts Summary – THSF**

Effector	Airspace Management Impacts	
	Scheduling/Coordination	Efficiency of Ongoing Operations
Aircraft Operations	<b>Proposed Action:</b> The number of sorties using Tyndall MOAs would be expected to increase requiring increased scheduling workload. New coordination process would be implemented between Air Force and FFS to avoid operational conflicts. <b>Subalternative 1:</b> Same as the Proposed Action, with less potential for impact due to reduced number of potential aircraft operations.	<b>Proposed Action:</b> Increased air traffic primarily at low altitudes over THSF. See-and-avoid procedures used in uncontrolled airspace. Minor increases in ATC workload generated by any aircraft entering Carrabelle Thompson Airport Class E airspace. Coordination between Air Force and FFS would avoid operational conflicts. <b>Subalternative 1:</b> Same as the Proposed Action, with less potential for impact due to reduced number of potential aircraft operations.

ATC = air traffic control; FFS = Florida Forest Service; MOA = military operations area; THSF = Tate's Hell State Forest

### 6.2.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for airspace management have been identified. All General Operational Constraints (Section [2.5](#)) and Proposed Resource-Specific Mitigations identified in Section [3.2.4](#) would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 6.3 NOISE

### 6.3.1 Affected Environment

#### *Proposed Action and Subalternative 1 (Preferred Alternative)*

The noise environment at THSF is generally the same for both the Proposed Action and Subalternative 1, with noise levels in THSF are similar to those described for BRSF in Section [5.3.1](#). Ambient noise levels in THSF are assumed to be approximately 45 dB DNL, although it is recognized that average noise levels in certain very remote areas within the ROI are lower. The Tyndall MOAs located above THSF are used for approximately 5,000 sorties per year. These sorties are primarily conducted by F-22 and T-38 aircraft based at Tyndall AFB. Although the floor altitude of Tyndall E and G MOAs are 300 feet AGL and 1,000 feet AGL, respectively, F-22 and T-38 aircraft operate at higher altitudes. [Table 6-4](#) lists individual overflight noise levels for F-22 and T-38C aircraft. Under current conditions, military aircraft training generates noise levels below 45 DNL<sub>mr</sub> beneath Tyndall F MOA and at about 67 dB DNL<sub>mr</sub> beneath Tyndall G MOA (U.S. Air Force, 2011b).

**Table 6-4. SEL Under the Flight Track for Aircraft Commonly Operating Above THSF**

Aircraft	SEL in dB <sup>1</sup>			Power	Speed (kts)
	500 feet AGL	1,000 feet AGL	10,000 feet AGL		
F-22	114	108	84	70% ETR	449
T-38	92	86	60	91% RPM	449
F-35A <sup>2</sup>	127	120	94	95% ETR	475
Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
UH-1	96	91	73	100% RPM	80

AGL = above ground level; dB = decibels; ETR = engine thrust request; kts = knots; RPM = revolutions per minute; SEL = sound exposure level; THSF = Tate's Hell State Forest

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity).

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010)

Civilian aircraft operations over THSF include FFS single-engine propeller driven aircraft and UH-1 aircraft. [Table 6-5](#) lists noise levels for these two aircraft. FFS aircraft use LZs at the locations that would be designated TH-2 and TH-4 under Subalternative 1 on an irregular 'as-needed' basis. UH-1 aircraft are primary users of the two LZs. Baseline noise levels at these two LZs do not exceed 55 dB DNL.

**Table 6-5. Comparative SEL Under the Flight Track for Aircraft Commonly Operating Above THSF**

Aircraft Category	Aircraft type	SEL in dB <sup>1</sup>			Power	Speed (kts)
		500 feet AGL	1,000 feet AGL	10,000 feet AGL		
Aircraft types To be used in GLI training	2-engine, propeller-driven <sup>2</sup>	84	79	62	100% RPM	200
	CV-22	94	90	72	60 degrees nacelle tilt	150
	H-60	91	87	N/A	LFO Lite 140 kts	140
	C-130H	95	90	67	800 CTIT	180
	H-47	87	82	60	Flyover at 120 kts	120
Aircraft types operating currently used over THSF	F-22	114	108	84	70% ETR	449
	T-38	92	86	60	91% RPM	449
	F-35A <sup>2</sup>	127	120	94	95% ETR	475
	Single-engine, propeller-driven aircraft	84	79	61	70% RPM	160
	UH-1	96	91	73	100% RPM	80

AGL = above ground level; dB = decibels; CTIT = turbine inlet temperature in degrees Celsius; dB = decibels; ETR = engine thrust request; GLI = Gulf Regional Airspace Strategic Initiative (GRASI) Landscape Initiative kts = knots; LFO Lite 140 kts = helicopter in level flight at 140 knots; RPM = revolutions per minute; SEL = sound exposure level ; THSF = Tate's Hell State Forest

1. Level flight, steady high-speed conditions. Used standard acoustical conditions (59 degrees Fahrenheit and 70 percent relative humidity)

2. The noise levels for the F-35A operating at high speeds were based on an empirical curve fit from the noise data contained in NoiseFile database for these high-speed operations (Wyle, 2010).

### 6.3.2 Environmental Consequences

As discussed in Section 3.3, adverse impacts may potentially occur from aircraft operations, UoEX, ground vehicles, and amphibious operations under the Proposed Action and aircraft and ground vehicles only under Subalternative 1. Other Proposed Action and Subalternative 1 effectors are not addressed in this section.

Aircraft and ground vehicles would follow variable routes to and from training locations in the state forest. Aircraft en route typically operate at or above 500 feet AGL unless operating within existing special use airspace. Areas outside the state forest would occasionally experience aircraft and surface vehicle noise at levels listed in [Table 3-10](#) and [Table 3-14](#) generated by vehicles en route. However, because routing would vary from one training mission to the next, overflight/pass-by of any given location would be infrequent, and noise impacts outside the state forests would be minimal.

Aircraft maneuvering at THSF would vary flight paths from one mission to the next. Assuming less than one hour is spent maneuvering per training event, distributed flying operations would generate less than 45 dB DNL<sub>mr</sub> under the Proposed Action and Subalternative 1.

#### 6.3.2.1 Aircraft Operations

##### *Proposed Action*

At THSF under the Proposed Action, as many as six sorties per annual average day distributed among active LZs/DZs would be conducted as part of LLHI/E, AD, A/LVL, and OHO training. Each training event could include up to four aircraft but would include only one or two aircraft under normal circumstances. The experience of a

person on the ground would be as described in Section [5.3.2.1](#) for BRSF. As would be the case at BRSF, about 20 percent of total annual operations would occur at least partially after 10:00 PM with the majority of these late-night operations taking place in summer months when the sun sets later. Operations noise, whether it is generated by a direct overflight or training at a distance, could be disruptive of activities (e.g., conversation, sleeping) and could be considered annoying. Several LZ/DZs would be established, and any given training locations would be used for less than one training event per day on average. LZ/DZs would be located at greater than 2,200 feet from known noise-sensitive locations. Under a conservative set of assumptions, which are described in Section [3.3.3](#) and in more detail in Appendix H (Section H.3), noise levels exceeding 55 dB DNL would not affect any known noise-sensitive locations.

At THSF there would be about one training event per day on average at LZs/DZs conducting LLHI/E, AD, and A/LVL once GLI training is at full capacity. Based on analyses presented in Section [3.3.3](#), noise levels exceeding 55 dB DNL would not be expected to occur at greater than 200 feet from approach/departure paths and 2,200 feet from the LZ/DZ. To avoid excessive annoyance with an extra margin of error, LZs/DZs, including run-in paths, should be sited no closer than these distances to known noise-sensitive locations (e.g., campgrounds, stables, hiking/horseback riding trails, privately owned parcels with residences).

OHO would take place at surveyed locations in open water at THSF up to once per month. Per Section [3.3.3](#), individual OHO operations could be annoying to people located nearby. To mitigate excessive annoyance, OHO hover locations should not be sited within 2,200 feet of known noise-sensitive locations, the same distance applied to LZs/DZs.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, there would be about 3 sorties per average annual day. Several aircraft currently operating in the airspace above THSF, such as the F-22 and T-38, generate noise levels higher than those typically generated by aircraft that would be involved in GLI training. The aircraft utilized as part of GLI would be of similar type and generate similar noise levels to those listed in [Table 6-5](#).

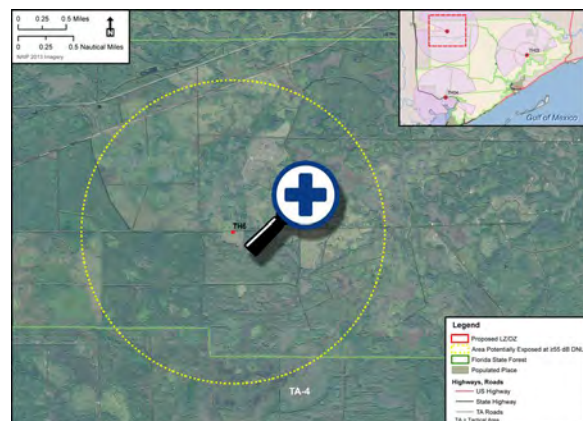
Maps showing areas potentially exposed to noise levels exceeding 55 dB DNL are shown in [Figure 6-24](#) through [Figure 6-26](#). As discussed in Section [3.3.3](#), a highly conservative approach was taken in determining areas potentially exposed at greater than 55 dB DNL. Areas potentially affected by noise levels in excess of 55 dB DNL were delineated for a scenario under which all inbound and outbound flights take place on a single flight path, actual flight paths would vary from one mission to the next resulting in fewer direct overflights of any given location and lower time-averaged noise levels than 55 dB DNL. Areas potentially exposed to noise levels exceeding 55 dB DNL were identified assuming that the single approach and departure flight path could be located anywhere within the potential fly zone defined through the aeromapping process (see Section [2.5](#) and [3.3.1.2](#)). Baseline FFS aircraft operations at TH-2 and TH-4 are relatively infrequent and contribute relatively little to overall noise levels. No known noise-sensitive locations exist within the areas potentially exposed to greater than 55 dB DNL developed using this highly-conservative method of delineation.



**Figure 6-24. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 2**



**Figure 6-25. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 4**



**Figure 6-26. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 6**

### 6.3.2.2 Munitions Use

#### *Proposed Action*

At THSF, firing of blank rounds and detonation of ground burst simulators would be permitted anywhere, subject to restrictions described later in this section. Paintball/plastic pellets and smoke grenades would be used at other locations, but these expendables generate minimal noise. An estimated 576,000 blank 5.56-mm rounds (8,000 per event), 196,200 blank 7.62-mm rounds (10,000 per event), would be fired annually under the Proposed Action. Blank rounds do not fire a bullet and are quieter than live rounds. Ground burst simulators (GBSs) are designed to sound similar to artillery rounds detonating. Two to five GBSs would be used per event, for a total of up to 5,172 annually.

As described in Army Regulation 200-1, noise-sensitive land uses are discouraged where small arms noise exceeds 87 dB PK 15(met) and strongly discouraged where small arms noise exceeds 104 dB PK 15(met). Army Regulation 200-1 discourages noise-sensitive land use where large arms noise exceeds 62 dB CDNL and strongly



discourages noise-sensitive land uses where large-arms noise exceeds 70 dB CDNL. [Table 3-13](#) lists distances from the training location at which gunfire noise levels drop below these impact levels. Noise levels are presented for a location 90 degrees to the right of the direction of firing. For the purposes of analysis, it was assumed that all GBS use would be evenly distributed among two locations at THSF. In fact, GBS use would be more widely distributed, so that GBS noise would be experienced infrequently at any given location. Calculated distances to threshold noise levels are conservative estimates of actual noise levels. To minimize adverse levels of noise and annoyance levels, use of noise-generating expendables would be restricted within 4,000 feet of noise-sensitive receptors.

### ***Subalternative 1 (Preferred Alternative)***

At THSF, use of expendables would not be permitted. Therefore, no noise impacts associated with expendable use at THSF are anticipated.

### **6.3.2.3 Ground Vehicle Operations**

#### ***Proposed Action***

As discussed in Section [3.3.3](#), ground vehicle operations (e.g., Roadway Vehicle Use BD, and OFVO) may generate noise that is annoying to people in the state forest or private inholdings, particularly when it occurs at night. Noise levels generated by two of the loudest vehicles expected to be used during GLI training are listed in [Table 3-14](#). Ground vehicles used in GLI training would be equipped with exhaust mufflers in compliance with Florida Statutes. Training would occur along roads that are used currently by heavy trucks (e.g., logging trucks) and other traffic. Noise impacts would be localized to the area where ground vehicles are operating and would be limited to the duration of the training event.

### ***Subalternative 1 (Preferred Alternative)***

Impacts would be generally the same as under the Proposed Action, with less frequent vehicle use resulting in less potential for associated noise impact.

### **6.3.2.4 Amphibious Operations**

#### ***Proposed Action***

AO would involve up to six watercraft equipped with motors up to 200 hp. These boats would generate noise that could be considered disruptive and annoying by people along the banks of the water body being used. The boats would be of a similar size and engine power to boats currently used on the same water bodies and would not be expected to exceed noise level thresholds established in Florida Statutes. During covert training operations in confined water bodies, full throttle would be expected to be used rarely, limiting the intensity of noise generated. This type of training could occur up to 10 times per year in water bodies where motor-powered boats are currently permitted. Noise impacts would be expected to be temporary, lasting the duration of the training exercise.

### Subalternative 1 (Preferred Alternative)

Under Subalternative 1 amphibious operations would not occur; therefore there would be no impacts associated with this activity.

### 6.3.3 Noise Impact Summary

[Table 3-8](#) describes the context, intensity, and duration factors utilized in analysis of impacts to noise receptors; based on these factors the Air Force has identified insignificant adverse noise-related impacts to public health and safety and the human and natural environment. Noise associated with aircraft operations and munitions use would result in annoyance to some recreational users and residences. However, implementation of operational constraints identified in [Section 2.5](#), as well as Proposed Resource-Specific Mitigations identified in the previous analysis, would minimize potential noise annoyance to less than significant and, in most cases, minimize noise to a negligible level. Noise levels would not be sufficiently intense to result in impacts other than annoyance or disturbance of recreational activities for those people not participating in the training. People involved in training would wear hearing protection if necessary, as required by DoD regulations. Activities such as munitions training and aircraft operations are either not regulated or are specifically exempted from local noise regulations. Ground vehicles and watercraft used during GLI training would be expected to generate noise levels below thresholds established in Florida Statutes.

[Table 6-6](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-6. Proposed Action/Subalternative 1 Noise Impacts Summary – THSF**

Effector	Training Location						
	Distributed Ops	Nominal LZ/DZ	All Subalternative 1 LZs/DZs	Nominal OHO Location	Nominal Munitions Training Location	Nominal Ground Vehicle Training Location	Nominal Body of Water (Amphibious Training)
Land Disturbance	1	N/A	N/A	N/A	1	N/A	N/A
Wheeled Vehicle Movement	N/A	N/A	N/A	N/A	N/A	1	N/A
Use of Expendables	N/A	N/A	N/A	N/A	2*	N/A	N/A
Aircraft Operations	3	4	5	4	N/A	N/A	N/A
Amphibious Operations	N/A	N/A	N/A	N/A	N/A	N/A	1*

DZ = drop zone; LZ = landing zone; N/A = not applicable; OHO = overwater hoist operations; Ops = operations; THSF = Tate's Hell State Forest

\*Would not occur under Subalternative 1.

1. Localized, short-term, and low-intensity noise.

2. Localized, recurring events over long term. Munitions noise thresholds exceeded at known noise-sensitive locations (e.g., residences), and management actions are needed to reduce impacts to levels considered moderate.

3. Noise from aircraft maneuvering affects a wide area; recurring events; minimum altitude applied to reduce impacts to levels considered moderate.

4. Aircraft affects localized area; recurring events; noise thresholds are exceeded and measures must be applied during site selection and mission planning to reduce impacts to levels considered moderate.

5. Noise from aircraft operations may be annoying to forest users on an intermittent, temporary basis. Application of LZ/DZ and approach/departure path selection criteria have resulted in no noise-sensitive locations being exposed to noise in excess of impact levels.

### 6.3.4 Proposed Resource-Specific Mitigations

While noise impacts can be minimized, they cannot be completely avoided due to the transient nature of training activities and recreational users, and the varying perception of annoyance amongst members of the public. In addition to the mitigations identified in Section 3.3.4, noise-generating expendables would not be used within 4,000 feet of noise-sensitive locations at THSF. This measure would further minimize noise impacts.

Figure 6-12 through Figure 6-22 show the areas in which training activities would be restricted based on buffer distances described above and in Section 3.3.4. Buffers would be established for all privately owned parcels containing at least one residential structure and all campgrounds.

## 6.4 SAFETY

### 6.4.1 Affected Environment

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

The affected environment for safety as it relates to proposed activities comprises the policies and procedures currently in place at Eglin AFB, previously discussed in Sections 3.4.2 and 3.4.3. The TFC of the FFS is primarily responsible for prevention, detection, and suppression of wildfires wherever they may occur and to respond to other emergencies.

The TFC, which encompasses Leon, Gadsden, Liberty, Wakulla, Jefferson and Franklin Counties, has reported approximately 87 annual average wildfires since January 2010 caused by various sources, such as campfires, debris burning, lightning, and children (Table 6-7). Of those, only about five on average were caused by equipment/vehicle use (FFS, 2013c).

**Table 6-7. Average Wildfires by Cause for THSF**

Cause	Fires Total	Fires Annual Average	Acres Total	Acreage Annual Average
Campfire	12	3	18.3	4.6
Children	13	3.2	44	11
Debris burn, authorized	60	15.1	517.7	129.4
Debris burn, nonauthorized	71	17.8	469.6	117.4
Equipment use (including vehicles)	20	5	67.2	16.7
Incendiary	16	4	361.4	90.4
Lightning	58	14.5	1,157.10	289.3
Miscellaneous	19	4.7	170.4	42.6
Power lines	15	3.8	9.4	2.4
Fireworks	1	0.2	0.2	0
Smoking	2	0.5	2.5	0.6
Unknown	60	15	943.5	235.9
<b>Total</b>	<b>347</b>	<b>86.8</b>	<b>3,761.3</b>	<b>940.3</b>

Source: FFS, 2013c

To respond to potential fires, TFC has eight forest rangers and four senior forest rangers that are certified wildland firefighters in the THSF area. THSF also has two primary certified wildland firefighter supervisors and an operations administrator. All certified personnel can be utilized for suppressing wildfires on THSF.

THSF firefighting equipment includes four John Deere 650 bulldozers (Type 2) with plows and four heavy bulldozers (Types 1 and 2) without plows for wildfire suppression and fire line reinforcement. All bulldozers have an accompanying transport for moving the equipment. In addition, the district has five Type 6 engines available for fire response. Specialized equipment available for wildfire use includes a mechanic truck for field repairs, portable fuel tanks, small water tenders, a backhoe, and various pickups and SUVs.

Three facilities are considered primary response locations in the THSF area. The THSF headquarters is located in Carrabelle. The other two sites are tower/office sites. One is located at St. James on the east side of the forest, and the other is East Bay Tower site, located on the west side of the forest.

To mitigate wildfire risk, THSF has an aggressive prescribed burning program. Upland forest lands are burned an average of every three to four years. This prevents high accumulations of vegetative fuels that contribute to catastrophic wildfires. THSF prescribe burns roughly 35 to 45 thousand acres a year.

THSF cooperates with local county, state and Federal resources to suppress wildfires in the local area. Cooperative agreements exist at the state and local level to allow paid and VFDs to assist with wildfire suppression and structure protection. The following fire departments commonly assist with wildfires on THSF: Alligator Point Fire Department, Apalachicola Fire Department, Carrabelle Fire Department, Dog Island Fire Department, East Point Fire Department, Lanark Village Fire Department, and the St. George Island Fire Department. Other surrounding fire departments may assist as needed.

FFS also maintains cooperative wildfire assistance agreements with US Forest Service and FWC. Each organization has a variety of conventional or specialized equipment and/or personnel available for significant wildfire incidents on THSF.

FFS also has agreements with the Florida Highway Patrol and Florida Department of Transportation to provide road closures and or signage necessary for smoke events on Federal and State highways.

FFS monitors weather conditions daily for wildfire planning and burning authorization purposes. It records rainfall at various locations, calculates the National Fire Danger Rating System values daily, and sets fire preparedness levels. FFS also monitors and estimates the KBDI and FDI for the State of Florida.

## **6.4.2 Environmental Consequences**

### ***Proposed Action***

As discussed in Section [3.4](#), potential adverse impacts may occur from wildfire associated with UoEX. Other proposed action effectors are not addressed in this section.

Impacts to THSF associated with safety would be the same as those described in Section [3.4](#). The Proposed Action would not negatively affect the ability to provide for safe operation of aircraft or other equipment, nor would it result in uncontrollable safety hazards to military personnel, the public, or property. Implementation of established procedures, as discussed in Sections [3.4.2](#) and [3.4.3](#), would ensure that activities associated with the Proposed Action would not result in significant impacts to safety.

At THSF, campfires are only allowed at designated camp sites, which would not be used by training personnel; however, campfires could be used at the hardened camp sites in designated fire pits. No campfires would be used in the interstitial areas of THSF. To minimize the potential for fires caused by the UoEX and general training activities (such as idling vehicles), before beginning missions, units would obtain the daily fire danger rating and coordinate with FFS personnel to ensure that adequate fire response is available, if needed per General Operational Constraints identified in Section [2.5](#). Units must also appoint a fire marshal on a daily basis (eligible personnel must have a minimum rank of a noncommissioned officer or equivalent rank) while in the field to ensure all personnel have been trained concerning the safe use of incendiary devices and to supervise the immediate suppression of fires. These wildfire mitigations will be implemented on state-owned or leased land as part of the proposed action.

Under Florida law, it is unlawful for any person to set fire to, or cause fire to be set to, any wildlands or to build a campfire or bonfire or to burn trash or other debris within the designated area of a severe drought emergency unless a written permit is obtained from the division or its designated agent.

The intent/objective of most of the training activities outside use of roadways or LZs within the forest is to remain unseen/unnoticed, as these are mostly Special Forces troops. Training activities within the forest outside of established roadways or LZs would typically avoid designated trails and always avoid recreational sites. Training would mainly occur in small forest management units in order to minimize interference with other users.

Personnel would avoid contact with the public to the extent possible. However, should there be an encounter military personnel would identify themselves and then suspend training activities and move away from the area, yielding to the public user. On roadways and vehicle trails military personnel would yield to the public. Section [2.5](#), Operations Constraint 3(i) provides examples of how the Air Force would coordinate with the FFS to make the public and recreationists aware of when and where training activities would occur prior to the activity. Additionally, Section [3.4](#) provides procedures that would be applied in military/civilian interactions.

Off road vehicle use is not part of the proposed action. All vehicle use will be limited to established forest roads. The use of spark arrestors or tailpipe shields are not necessary, but would be implemented if the FFS deems it necessary. The USFS generally does not require spark arrestors and tailpipe shields for vehicles that stay primarily on established roadways.



### Subalternative 1 (Preferred Alternative)

Under Subalternative 1, the potential impacts to safety associated with ground activity and aircraft would be similar to those as described under the Proposed Action. However, the potential for impacts, and the extent of those impacts, would be substantially less than the Proposed Action. Expendable use would not occur and there would only be three active LZs/DZs located in relatively remote locations that are already currently being used by the FFS; aircraft activities would occur on a less frequent basis. Consequently, while there is potential for adverse impacts, under Subalternative 1 would have a substantially lesser impact on than under the Proposed Action.

### 6.4.3 Safety Impact Summary

[Table 3-16](#) describes the context, intensity, and duration factors utilized in analysis for impacts to safety; based on these factors the Air Force has identified insignificant safety-related impacts to public health and safety and the human and natural environment. The potential for wildfire occurrence associated with training activities could result in adverse impacts. However, requirements identified in [Section 2.5](#) associated with wildfire prevention and response would minimize the potential for this impact to occur.

[Table 6-8](#) summarizes the impacts identified for both the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-8. Proposed Action/Subalternative 1 Safety Impacts Summary – THSF**

Effector	Safety Receptor Type (Applies to All THSF TAs)	
	Military Personnel	General Public
Land Disturbance		
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with these activities (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> Same as Proposed Action, with less potential for impact associated with the reduced level of proposed activity.	
Point impact		
Incidental surface disturbance		
Consumption		
Ground Movement		
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> Same as Proposed Action, with less potential for impact associated with the reduced level of proposed activity.	
Dismounted maneuver		
Use of Expendables		
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section <a href="#">3.4</a> ). <b>Subalternative 1:</b> There would be no UoEX at THSF under this alternative.	Risk of wildfire is increased due to expendable use (GBSs at the hardened camp sites, smoke grenades, generators, etc.), which could affect the safety of the general public. However, GBS use would be restricted according to Section <a href="#">2.5</a> , and the increase in potential wildfires caused by idling vehicles and other equipment would be negligible. While the risk of wildfire is unavoidable under the Proposed Action, General Operational Constraints, as well as fire management procedures implemented by both Eglin
Smoke grenades		
Other/equipment		

**Table 6-8. Proposed Action/Subalternative 1 Safety Impacts Summary – THSF, Cont'd**

Effector	Safety Receptor Type (Applies to All THSF TAs)	
	Military Personnel	General Public
		AFB personnel, and the FFS would serve to minimize this potential (see Section 6.4.2). <b>Subalternative 1:</b> There would be no UoEX at THSF under this alternative, thus greatly reducing the potential for wildfire incidents.
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> Aircraft operations would be significantly less than those under the Proposed Action and associated potential impacts would be less.	
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> There would be no amphibious operations at THSF under this alternative.	
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse safety impacts associated with this activity (see Section 3.4). <b>Subalternative 1:</b> Same as Proposed Action, with less potential for impact associated with the reduced level of proposed activity.	

GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest; UoEX = Use of Expendables

#### 6.4.4 Proposed Resource-Specific Mitigations

All constraints and mitigations, mainly associated with wildfire prevention, are identified in Section 3.4.3. While these constraints and mitigations would minimize the potential for wildfires, the potential for increased wildfire occurrence cannot be completely avoided under the Proposed Action, and the potential for adverse safety impacts to THSF remains. The increased potential for wildfire can only be avoided through implementation of the No Action Alternative.

### 6.5 AIR QUALITY

#### 6.5.1 Affected Environment

THSF is located in Franklin and Liberty Counties in Florida, which are in attainment for all criteria pollutants (USEPA, 2014).

Baseline emissions for Franklin and Liberty Counties utilized in this document are presented in Table 6-9. These emissions data were acquired from the USEPA's 2011 NEI data for Franklin County (USEPA, 2014a). The county data include emissions data from point sources, area sources, and mobile sources

**Table 6-9. Baseline Emissions Inventory for Franklin and Liberty Counties**

County	Pollutant (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Franklin	38,310	1,824	4,731	3,017	338	30,932	661,247
Liberty	29,590	1,419	4,558	2,728	309	39,997	1,448,823

Source: USEPA, 2014a

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

### 6.5.2 Environmental Consequences

As discussed in Section 3.5, potential adverse impacts to air quality may occur from use of wheeled vehicles, expendables, and aircraft and Amphibious Operations. Other Proposed Action effectors are not addressed in this section.

Emissions from training activities were compared with those of Franklin and Liberty counties to determine the impacts. While it is likely that air emissions would be distributed between the two counties, it is unknown exactly how this distribution would occur, because it would depend on the location of specific training events. As a result, air emissions analyses compared the estimated Proposed Action emissions with each county's baseline emissions, as well as those of the entire ROI (which would include both Franklin and Liberty Counties).

#### Proposed Action

Emissions for fugitive dust for each training activity are provided in Section 3.5. These emissions would cause negligible (less than 5 percent of emissions in each county and the ROI) short-term impacts to regional air quality (Table 6-10).

**Table 6-10. Proposed Action Fugitive Dust Emissions Compared with the ROI - THSF**

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
<b>Total</b>	<b>5.76</b>	<b>42.46</b>
% of County Baseline Emissions		
Franklin County		1.41
Liberty County		1.56
Total ROI baseline emissions		5,745
% Emissions of ROI		0.74%

PM = particulate matter; ROI = region of influence; THSF = Tate's Hell State Forest

Wheeled vehicle emissions associated with each training activity are provided in Section 3.5. Vehicles operating in the ROI would emit negligible short-term levels of air pollutants (Table 6-11). GHG and air pollutant emissions would not exceed thresholds for significant negative impacts.

**Table 6-11. Proposed Action Wheeled Vehicle Air Emissions Compared with the ROI – THSF**

Wheeled Vehicle Emissions	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
<b>Total/Year</b>	<b>21.05</b>	<b>6.23</b>	<b>0.95</b>	<b>1.01</b>	<b>0.47</b>	<b>20.03</b>	<b>709.12</b>
% of County Baseline Emissions							
Franklin County	0.05%	0.34%	0.02%	0.03%	0.14%	0.06%	0.11%
Liberty County	0.07%	0.44%	0.02%	0.04%	0.15%	0.05%	0.05%
<b>Total ROI baseline emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.03%</b>	<b>0.19%</b>	<b>0.01%</b>	<b>0.02%</b>	<b>0.07%</b>	<b>0.03%</b>	<b>0.03%</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

Emissions from training munitions are provided in Section 3.5. [Table 6-12](#) summarizes emissions from training munitions. The emissions calculated are for all proposed munitions and would result in a negligible impact on air quality.

**Table 6-12. Proposed Action Training Munitions Emissions Compared with the ROI – THSF**

Munitions Emissions	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Maximum emissions/year	0.18	0.02	0.75	0.21	0.00	0.00	0.35
% of County Baseline Emissions							
Franklin County	0.08%	0.34%	0.03%	0.05%	0.14%	0.10%	0.11%
Liberty County	0.11%	0.44%	0.03%	0.05%	0.16%	0.08%	0.05%
<b>Total ROI baseline emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.05%</b>	<b>0.19%</b>	<b>0.01%</b>	<b>0.02%</b>	<b>0.07%</b>	<b>0.04%</b>	<b>0.04%</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

Aircraft emissions were provided previously in Section 3.5. [Table 6-13](#) summarizes emissions from aircraft operations for the different types of activities. Aircraft operations would cause short- to medium-term impacts to air emissions in Franklin County. In particular, NO<sub>x</sub> and SO<sub>2</sub> would cause a 7.64 and 3.11 percent increase in air pollutant emissions in Franklin County, and 9.82 and 3.40 percent increase, respectively, in Liberty County ([Table 6-13](#)). However, this analysis assumed all activities would occur within a single county. It is more likely that air emissions would be comparable to those of the entire ROI, because air operations would be distributed between the two counties. Consequently, aircraft emissions would likely result in an approximate 4.29 percent increase in NO<sub>x</sub> and a 1.63 percent increase in SO<sub>2</sub> air emissions over the two-county area. Aircraft emissions evaluated based on context, intensity, and duration (see [Table 3-19](#)) would not be greater than 10 percent and would not affect either county's attainment status.

**Table 6-13. Aircraft Emissions Compared with the ROI – THSF**

Aircraft Emissions	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
<b>Total/Year</b>	<b>29.67</b>	<b>121.75</b>	<b>29.48</b>	<b>34.38</b>	<b>8.24</b>	<b>2.5</b>	<b>10,751</b>
% of County Baseline Emissions							
Franklin County	0.08%	6.67%	0.62%	1.14%	2.44%	0.01%	1.63%
Liberty County	0.10%	8.58%	0.65%	1.26%	2.67%	0.01%	0.74%
<b>Total ROI Baseline Emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.04%</b>	<b>3.75%</b>	<b>0.32%</b>	<b>0.60%</b>	<b>1.27%</b>	<b>0.00%</b>	<b>0.51%</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

Amphibious Operations require the use of watercraft. Emissions from such sources would have negligible short-term impacts to regional air quality ([Table 6-14](#)).

**Table 6-14. Amphibious Operations Emissions Compared with the ROI – THSF**

Source	Emissions (tons)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2e</sub>
Amphibious Operations/event	0.00	0.00	0.00	0.00	0.05	0.44	0.44
Amphibious Operations/year	0.01	0.01	0.00	0.01	0.48	4.42	4.42
% of County Baseline Emissions							
Franklin County	0.00%	0.00%	0.00%	0.00%	0.14%	0.01%	0.00%
Liberty County	0.00%	0.00%	0.00%	0.00%	0.16%	0.01%	0.00%
<b>Total ROI Baseline Emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.07%</b>	<b>0.01%</b>	<b>0.00%</b>

CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

### **Subalternative 1 (Preferred Alternative)**

Under Subalternative 1, munitions use would only take place at the STOP and SRYA hardened camp sites at BRSF. There would be no munitions training at THSF, therefore there would be no impact to air quality due to munitions emissions. Additionally, there would be no amphibious operations under Subalternative 1.

Emissions for fugitive dust and wheeled vehicle emissions for each training activity are provided in Section 3.5. These emissions would cause negligible (less than 5 percent of emissions in each county and the ROI) short-term impacts to regional air quality ([Table 6-15](#) and [Table 6-16](#)). GHG and air pollutant emissions would not exceed thresholds for significant negative impacts.

**Table 6-15. Subalternative 1 Fugitive Dust Emissions Compared with the ROI – THSF**

Fugitive Dust Emissions	PM (tons/event)	PM (tons/year)
<b>Total</b>	<b>5.43</b>	<b>40.69</b>
% of County Baseline Emissions		
Franklin County		1.35
Liberty County		1.49
Total ROI baseline emissions		5,745
<b>% Emissions of ROI</b>		<b>0.71%</b>

PM = particulate matter; ROI = region of influence



**Table 6-16. Subalternative 1 Wheeled Vehicle Air Emissions Compared with the ROI THSF**

Wheeled Vehicle Emissions	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2</sub> e
<b>Total/Year</b>	<b>15.72</b>	<b>6.21</b>	<b>0.77</b>	<b>0.82</b>	<b>0.47</b>	<b>14.57</b>	<b>693</b>
% of County Baseline Emissions							
Franklin County	0.04%	0.34%	0.02%	0.03%	0.14%	0.05%	0.10%
Liberty County	0.05%	0.44%	0.02%	0.03%	0.15%	0.04%	0.05%
<b>Total ROI baseline emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.02%</b>	<b>0.19%</b>	<b>0.01%</b>	<b>0.01%</b>	<b>0.07%</b>	<b>0.02%</b>	<b>0.03%</b>

CO = carbon monoxide; CO<sub>2</sub>e = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

Aircraft emissions were provided previously in Section 3.5. Table 6-17 summarizes emissions from aircraft operations. Aircraft operations would cause short-term impacts to air emissions in Franklin and Liberty Counties. In particular, NO<sub>x</sub> and SO<sub>2</sub> would cause a 1.72 and 0.78 percent increase in air pollutant emissions in Franklin County, and 2.21 and 0.85 percent increase, respectively, in Liberty County (Table 6-13). However, this analysis assumed all activities would occur within a single county. It is more likely that air emissions would be comparable to those of the entire ROI, because air operations would be distributed between the two counties. Consequently, aircraft emissions would likely result in an approximate 0.97 percent increase in NO<sub>x</sub> and a 0.40 percent increase in SO<sub>2</sub> air emissions over the two-county area. Further, it is likely that a more aircraft training would take place at BRSF due to the presence of Blackwater airfield and the STOP and SRYA Camps. Aircraft emissions evaluated based on context, intensity, and duration (see Table 3-19) would not be greater than 10 percent and would not affect either county's attainment status.

**Table 6-17. Subalternative 1 Aircraft Emissions Compared with the ROI – THSF**

Aircraft Emissions	Emissions (tons/year)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2</sub> e
<b>Total/Year</b>	<b>8.9</b>	<b>31.3</b>	<b>7.28</b>	<b>8.4</b>	<b>2.62</b>	<b>1.36</b>	<b>5,641</b>
% of County Baseline Emissions							
Franklin County	0.02%	1.72%	0.15%	0.28%	0.78%	0.00%	0.85%
Liberty County	0.03%	2.21%	0.16%	0.31%	0.85%	0.00%	0.39%
<b>Total ROI Baseline Emissions</b>	<b>67,900</b>	<b>3,243</b>	<b>9,289</b>	<b>5,745</b>	<b>647</b>	<b>70,929</b>	<b>2,110,071</b>
<b>% Emissions of ROI</b>	<b>0.01%</b>	<b>0.97%</b>	<b>0.08%</b>	<b>0.15%</b>	<b>0.40%</b>	<b>0.00%</b>	<b>0.27%</b>

CO = carbon monoxide; CO<sub>2</sub>e = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; THSF = Tate's Hell State Forest; VOC = volatile organic compound

### 6.5.3 Air Quality Impact Summary

Table 3-19 describes the context, intensity, and duration factors utilized in analysis for impacts to air quality; based on these factors the Air Force has identified insignificant adverse impacts to air quality. In summary, training activities would result in small

amounts of air emissions when compared with the baseline. However, these emissions are still within emission standard guidelines and would not adversely impact public health or safety or the human and natural environment.

[Table 6-18](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-18. Proposed Action Air Quality and Greenhouse Gas Emission Impacts Summary – THSF**

Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2</sub> e
Ground Movement	0.03%	0.19%	0.01%	0.02%	0.07%	0.03%	0.03%
Use of Expendables	0.05%	0.19%	0.01%	0.02%	0.07%	0.04%	0.04%
Aircraft Operations	0.04%	3.75%	0.32%	0.60%	1.27%	0.00%	0.51%
Amphibious Operations	0.00%	0.00%	0.00%	0.00%	0.07%	0.01%	0.00%
<b>Total % of ROI emissions</b>	<b>0.12%</b>	<b>4.13%</b>	<b>0.34%</b>	<b>0.64%</b>	<b>1.48%</b>	<b>0.08%</b>	<b>0.58%</b>

CO = carbon monoxide; CO<sub>2</sub>e = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

Similar to the Proposed Action, training activities under Subalternative 1 would result in small amounts of air emissions when compared with the baseline. However, these emissions are still within emission standard guidelines and would not adversely impact public health or safety or the human and natural environment. [Table 6-19](#) summarizes the impacts identified. As shown in [Table 6-19](#), the estimated emissions for NO<sub>x</sub> would be substantially less than the Proposed Action, thus eliminating the potential for adverse impacts.

**Table 6-19. Subalternative 1 Air Quality and Greenhouse Gas Emission Impacts Summary– THSF**

Effector	Air Quality/Greenhouse Gases (% ROI Emissions)						
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOCs	CO <sub>2</sub> e
Ground Movement	0.02%	0.19%	0.01%	0.01%	0.07%	0.02%	0.03%
Aircraft Operations	0.01%	0.97%	0.08%	0.15%	0.40%	0.00%	0.27%
<b>Total % of ROI emissions</b>	<b>0.03%</b>	<b>1.16%</b>	<b>0.09%</b>	<b>0.16%</b>	<b>0.47%</b>	<b>0.02%</b>	<b>0.30%</b>

CO = carbon monoxide; CO<sub>2</sub>e = carbon dioxide equivalent; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter with a diameter of 10 microns or less; PM<sub>2.5</sub> = particulate matter with a diameter of 2.5 microns or less; ROI = region of influence; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound

#### 6.5.4 Proposed Resource-Specific Mitigations

No Resource-Specific Mitigations for air quality have been identified.

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## 6.6 EARTH RESOURCES

### 6.6.1 Affected Environment

This section discusses the geologic and soil resources that compose THSF. Discussion focuses on impact assessment resource features and issues identified in Section [3.6, Earth Resources](#).

#### 6.6.1.1 Geologic Resources

The following subsections discuss the land-surface form, sensitive karst terrain, and closed depression geologic features of THSF.

##### Land-Surface Form

###### *Proposed Action / Subalternative 1 (Preferred Alternative)*

The THSF land-surface form is a component of the Terraced Coastal Lowland, Apalachicola delta complex and primarily consists of low marine terraces created by ocean currents and wave actions when sea levels were higher (USDA, 1994). The forest lies between the Ochlocknee and Apalachicola Rivers on the deep sedimentary materials of the Apalachicola Embayment. Much of the Pleistocene epoch sediments are composed of extensive clay layers and graded quartz sand not found elsewhere in northwest Florida (Kindell, 1997). Land elevations generally range from sea level along the coast to 42 feet above mean sea level on the relict quartz sand dune ridges of the Talbot marine terraces. Slopes are moderate near the coast and level to nearly level in most other areas of the forest.

The low, swampy conditions that characterize much of THSF are a product of the delta formed by the Apalachicola River as it enters Apalachicola Bay and the slowly permeable clay layers that underlie much of the forest (USDA, 1994). The THSF contains shallow-gradient terraces, low ridges, flats, depressions, swamps, and marshes that often exhibit fluctuating near-surface water tables and/or frequent to occasional flooding (Photo: Tate's Hell State Forest Typical Land-Surface Form). As a consequence of low elevations and minor relief, runoff is slow and drainage is generally characterized by numerous sluggish tributary drains that are often bounded by wet plains, swamps, and marshes (Mooney and Patrick, 1916). There are no identified commercially mined mineral resources within THSF (USDA, 1994).



**THSF Typical Land-Surface Form** (Photo by Greg Kesler)

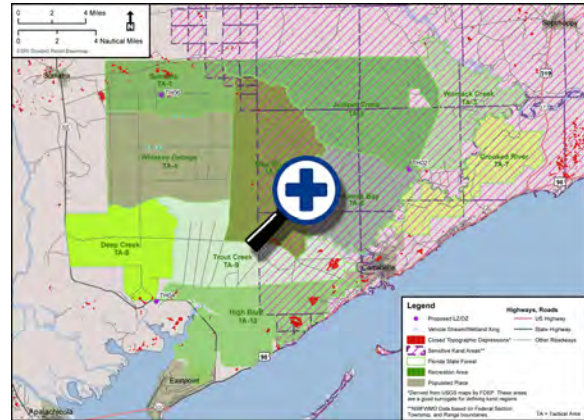
## Sensitive Karst Terrain

### Proposed Action

The areas of sensitive karst terrain occurring on THSF are listed in [Table 6-20](#) and shown in [Figure 6-27](#). Karst areas were identified as occurring in all tactical areas except Whiskey George (TA-4) and Deep Creek (TA-8). Approximately 47 percent of sensitive karst terrain occurs within Juniper Creek (TA-2) and New River (TA-5).

**Table 6-20. THSF Sensitive Karst Areas**

Tactical Area (TA)	Acres
Sumatra (TA-1)	951
Juniper Creek (TA-2)	31,335
Womack Creek (TA-3)	14,012
Whiskey George (TA-4)	0
New River (TA-5)	20,712
Pickett's Bay (TA-6)	16,865
Crooked River (TA-7)	13,223
Deep Creek (TA-8)	0
Trout Creek (TA-9)	7,126
High Bluff (TA-10)	7,499
<b>Total</b>	<b>111,723</b>



**Figure 6-27. THSF Sensitive Karst Areas, Closed Depressions, and Gulf Coastline**

### Subalternative 1 (Preferred Alternative)

Only proposed LZ/DZ TH2 is located within general sensitive karst terrain as shown in [Figure 6-27](#).

## Closed Depressions

### Proposed Action

Geologic features that influence the form and functions of land-surface forms within some High Bluff (TA-10) coastal areas are the closed depressions. Two types of closed depressions that occur within the THSF coastal region include muck and sand depressions (USDA, 1916). Closed depression subsidence incidents for THSF are summarized in [Table 6-21](#) and shown in [Figure 6-27](#). No THSF closed depressions have been classified as karst sinkholes. About 70 percent of THSF closed depressions are within Sumatra (TA-1) and High Bluff (TA-10) TAs.

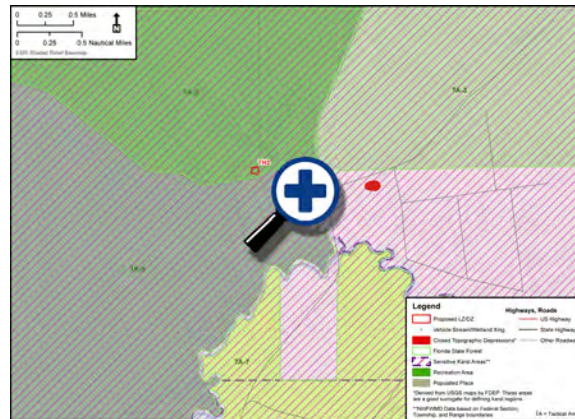
### Subalternative 1 (Preferred Alternative)

Closed depressions associated with individual LZs/DZs are shown in [Figure 6-28](#) through [Figure 6-30](#). There are no closed depressions associated with the identified LZs/DZs.

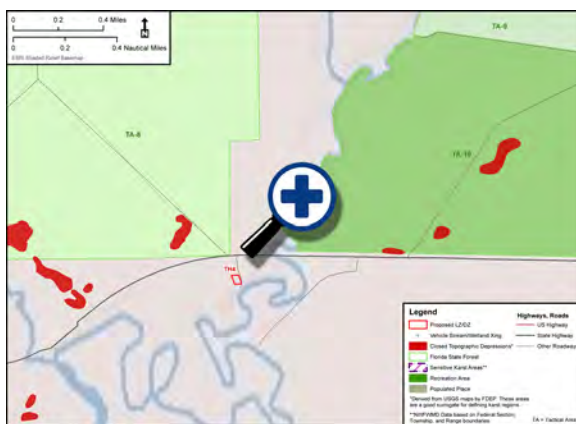
**Table 6-21. THSF Closed Depression Subsidence Areas**

Tactical Area	Number	Acres
Sumatra (TA-1)	30	149
Juniper Creek (TA-2)	0	0
Womack Creek (TA-3)	1	5
Whiskey George (TA-4)	0	0
New River (TA-5)	9	55
Pickett's Bay (TA-6)	0	0
Crooked River (TA-7)	0	0
Deep Creek (TA-8)	5	15
Trout Creek (TA-9)	5	158
High Bluff (TA-10)	17	273
<b>Total</b>	<b>67</b>	<b>655</b>

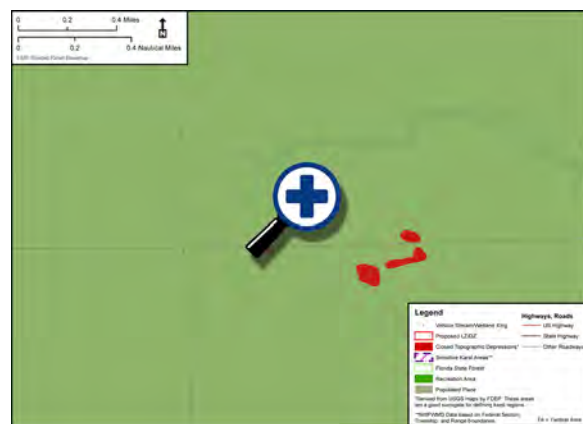




**Figure 6-28. Closed Depressions, Steepheads, and Borrow Pits – TH2**



**Figure 6-29. Closed Depressions, Steepheads, and Borrow Pits – TH4**



**Figure 6-30. Closed Depressions, Steepheads, and Borrow Pits – TH6**

### 6.6.1.2 Soil Resources

#### Soils Inventory

##### *Proposed Action*

The 6 soil orders, 9 soil suborders, and 55 soil series that compose THSF are summarized in [Table 6-22](#) and shown in [Figure 6-31](#). Many THSF landforms exhibit wet soils conditions and are defined as hydric soils (see [Section 6.6.1.2](#)). Approximately 55 percent of the THSF soil series is classified as hydric and about 98 percent of the forest land area is designated as hydric; for all TAs, the percent hydric soils was 90 percent and greater. The highest concentration of nonhydric areas is the Psammets soil suborder along the marine terrace coastline in High Bluff (TA-10) ([Table 6-23](#) and [Figure 6-32](#)). More detail by tactical area is provided in Appendix E, *Earth Resources*.



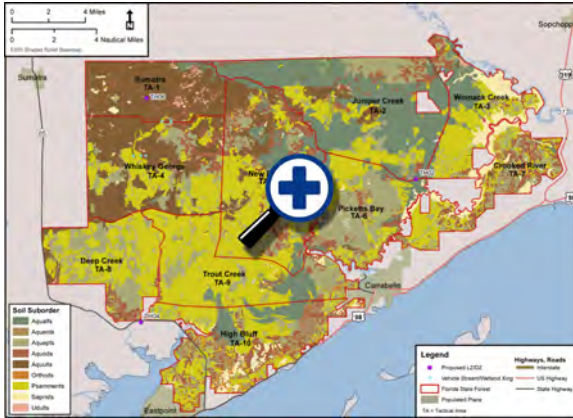


Figure 6-31. TSHF Soil Suborders

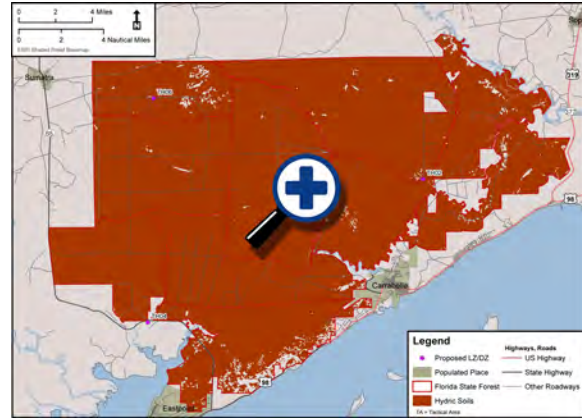


Figure 6-32. TSHF Hydric Soils

Table 6-22. TSHF Soils Summary

Soil Taxonomy Class	Total (Acres)
1 Alfisols Soil Order	
1A Aqualfs Soil Suborder	1
2 Entisols Soil Order	2
2A Aquents Soil Suborder	2
2B Psamments Soil Suborder	2
3 Histosols Soil Order	
3A Sapristis Soil Suborder	3
4 Inceptisols Soil Order	
4A Aquepts Soil Suborder	4
5 Spodosols Soil Order	5
5A Aquods Soil Suborder	5
5B Orthods Soil Suborder	5
5 Ultisols Soil Order	5
5A Aquults Soil Suborder	5
5B Udufts Soil Suborder	5

Table 6-23. TSHF Hydric Soils

Tactical Area (TA)	Hydric Soils (acres)	Percent of TA Total
Sumatra (TA-1)	14,242	96
Juniper Creek (TA-2)	31,116	99
Womack Creek (TA-3)	13,418	96
Whiskey George (TA-4)	24,693	100
New River (TA-5)	29,045	100
Pickett's Bay (TA-6)	16,716	99
Crooked River (TA-7)	12,851	96
Deep Creek (TA-8)	16,520	100
Trout Creek (TA-9)	20,867	99
High Bluff (TA-10)	20,539	90
<b>Total</b>	<b>200,007</b>	<b>—</b>

**Subalternative 1 (Preferred Alternative)**

Hydric soils associated with individual LZs/DZs are shown in [Figure 6-32](#). LZs/DZs TH2 and TH6 are located within hydric soils.

## Prime Farmland Soils

### Proposed Action

THSF prime farmland soils include Goldsboro loamy sand found within the Sumatra TA (TA-1), composing less than 0.5 percent (66 acres) of the total forest area ([Table 6-24](#)).

**Table 6-24. Tate's Hell State Forest Prime Farmland Soils (Sumatra TA-1)**

Soil Series Name	Acres <sup>1</sup>	Percent of Forest
Goldsboro loamy sand, 0 to 2 percent slopes	51	0.34
Goldsboro loamy sand, 2 to 5 percent slopes	15	0.09
<b>Total</b>	<b>66</b>	<b>0.43</b>

TA = tactical area

1. Total area does not include borrow pits, water, urban lands, Aquents, gullied lands, and other variants.

### Subalternative 1 (Preferred Alternative)

Prime farmlands associated with individual LZs/DZs are shown in [Figure 6-33](#) through [Figure 6-35](#). None of the identified LZs/DZs are located within prime farmland.



**Figure 6-33. Prime Farmland – TH2**



**Figure 6-34. Prime Farmland – TH4**



**Figure 6-35. Prime Farmland – TH6**



**Table 6-25. THSF Unpaved Roads Summary**

Unpaved Road Class	Road Surface Type	Road Width (feet)	Road Length (miles)
Primary	Dirt	12–18	103
		24–25	5
	Rock	10–18	20
Secondary	Dirt	5–10	8
		12–15	121
		18	33
	Sand	12	1
Tertiary	Dirt	5–10	158
		11–15	288
		16–28	51
		30	3
	Rock	5	1
		10	1
	Sand	10	1
		12	2
Activity	Dirt	5–10	3
		12–15	3
Service	Dirt	5–10	1
		12–15	2
		24	1
Total			806

There are approximately seven unpaved road crossings on THSF ([Table 6-26](#)) that occur in TA-1 through TA-4. Potential crossings include bridges, culverts, and low water crossings. A discussion of the environmental effects of unpaved roads and crossings is provided in Section [6.6.1.2, Soil Erosion](#). THSF has developed a road plan (FDACS, Division of Forestry, 2007) outlining road removal, road bridge and low water crossing upgrades and maintenance activities, and updates to the forest road network database to promote a comprehensive road network maintenance program. Planned unpaved road and crossing activities to restore hydrology will include installation of culverts, low water crossings, and roadside ditch plugs and/or reshaping of road surfaces.

**Table 6-26. THSF Unpaved Road Crossings**

Tactical Area (TA)	Number of Crossings <sup>1</sup>
Sumatra (TA-1)	2
Juniper Creek (TA-2)	1
Womack Creek (TA-3)	1
Whiskey George (TA-4)	3
New River (TA-5)	0
Picketts Bay (TA-6)	
Crooked River (TA-7)	
Deep Creek (TA-8)	
Trout Creek (TA-9)	
High Bluff (TA-10)	
<b>Total</b>	<b>7</b>

1. Includes culvert, bridge, and low water crossings

Additional information can be found at [http://www.floridaforestservice.com/state\\_forests/sf\\_management\\_plans/THSF/THSF%20FINAL%202007%20PLAN.pdf](http://www.floridaforestservice.com/state_forests/sf_management_plans/THSF/THSF%20FINAL%202007%20PLAN.pdf).

Road operational maintenance equipment includes road graders, dump trucks, and farm tractors with implements, choppers, and a backhoe. Road shoulders are maintained by tandem roller drum chopping, followed by harrowing and finish grading. The long-term goal is to maintain road shoulder on primary and secondary unpaved roads using tractor mowers (FDACS, 2007). Unpaved roads maintenance is conducted in compliance with the forest road standards described in the Road and Bridge Plan (FDACS Division of Forestry [DOF] Policies and Procedures 500.108) and silviculture BMPs manual (FDACS, 2008) developed by FDACS, Department of Forestry for each state forest (FDACS, 2007).



**THSF Sand Tertiary Road** (Photo by Greg Kesler)

## 6.6.2 Environmental Consequences

As discussed in Section 3.6.3, potential adverse impacts to earth resources may occur from land development activities, use of wheeled vehicles and dismounted movement, and aircraft and AO. Other proposed action effectors are not addressed in this section.

### 6.6.2.1 Land Disturbance

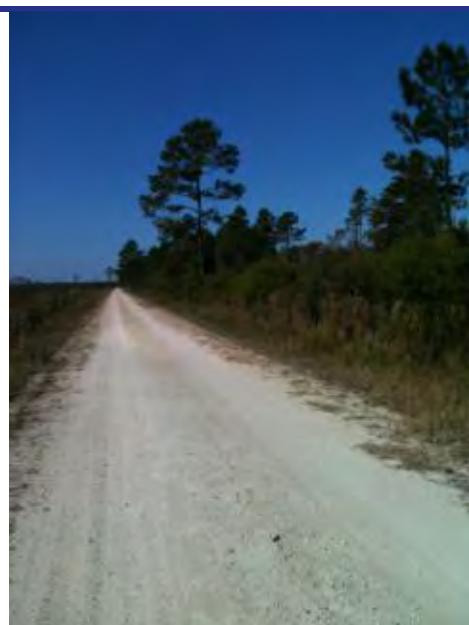
#### *Proposed Action / Subalternative 1 (Preferred Alternative)*

As discussed in Section 3.6.3, use of LZs/DZs, point impacts, consumption, and incidental land disturbance would have no adverse impact on soils. Impacts to THSF earth resources identified in Section 6.6.1 would generally be the same as those described in Section 3.6.

### 6.6.2.2 Ground Movement

#### *Proposed Action*

As discussed in Section 3.6, ground movement has the potential for causing soil erosion; however, this potential is considered negligible given general operating procedures identified in Section 2.5 and the Proposed Resource-Specific Mitigations identified in Section 3.6.4. Based on information provided in Section 3.6, THSF temporary low- and moderate-use camp site suitability and limitation constraint areas are summarized in [Table 6-27](#) and [Figure 6-37](#).



**THSF Crushed Limestone Tertiary Road** (Photo by Greg Kesler)



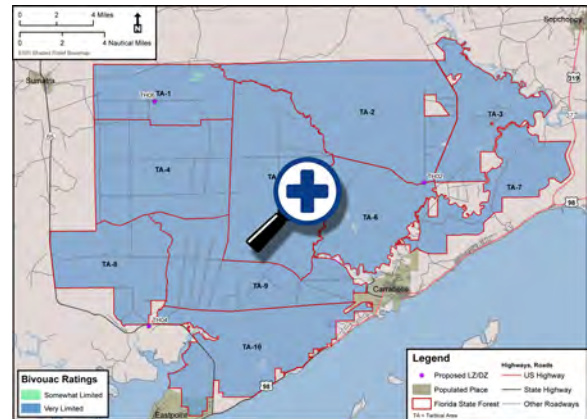
THSF tactical area lands were rated as somewhat limited or very limited for bivouac suitability. Limitations would be less restrictive on sites for tents or remote camps. Areas identified as very limited would not be suitable for bivouacking. Bivouac constraint areas are summarized in [Table 6-27](#) and depicted in [Figure 6-37](#).

**Table 6-27. THSF Bivouac Constraint Areas<sup>1</sup>**

Tactical Area (TA)	Constraint Area (acres)		Total Area (acres)
	Somewhat Limited	Very Limited	
Sumatra (TA-1)	75	14,741	14,816
Juniper Creek (TA-2)	0	31,253	31,253
Womack Creek (TA-3)	0	13,908	13,908
Whiskey George (TA-4)	0	24,785	24,785
New River (TA-5)	0	29,141	29,141
Picketts Bay (TA-6)	0	16,745	16,745
Crooked River (TA-7)	0	13,298	13,298
Deep Creek (TA-8)	0	16,529	16,529
Trout Creek (TA-9)	0	21,029	21,029
High Bluff (TA-10)	0	22,774	22,774
<b>Total</b>	<b>75</b>	<b>204,203</b>	<b>204,278</b>

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

Constraint areas where mission impact-induced earth resource effects are most likely to occur include closed depressions, steepheads, and hydric and erodible soils. Steepheads and closed depressions represent locations where steep slopes and sustained wet soil conditions are sensitive to soil disturbances from troop movements. These areas are associated with LU-1 and LU-2 constraint categories as identified in [Section 2.5](#). These types of impacts would mostly likely occur during dismounted maneuvers.



**Figure 6-37. THSF Bivouac Constraint Areas**

As discussed in [Section 3.6](#), no adverse impacts to off-road areas would occur from wheeled vehicles. Proposed use of unpaved roads and crossings could degrade and destabilize unpaved road soil or aggregate surfaces, which could increase soil erosion and sedimentation. However, the proposed mission frequency as identified in Chapter 2 would likely not exceed the carrying capacity of available unpaved roads or be greater than the current level of vehicle use. Vehicles traversing low-water crossings could destabilize road approach slopes and increase soil erosion. Generally, the potential sources of sediment are limited to the portions of the road in immediate contact with the water course and the distance of road slopes from the gradient crest to the stream. Driving through a stream also mobilizes streambed sediments.

However, implementation of General Operational Constraints identified in [Section 2.5](#), along with implementation of Proposed Resource-Specific Mitigations in [Section 3.6.4](#), would serve to minimize impacts to earth resources.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1 wheeled vehicle movement would have the same general impact as that described under the Proposed Action.

Under Subalternative dismounted movement activities would generally be the same as under the Proposed Action, with a reduced level of activity and no Bivouacking.

Overall, the potential and level of impacts would be less versus the Proposed Action due to the reduced level of activity proposed under Subalternative 1. Subalternative 1 would still require implementation of General Operational Constraints identified in Section [2.5](#), along with implementation of Proposed Resource-Specific Mitigations in Section [3.6.4](#) would serve to minimize impacts to earth resources.

### **6.6.2.3 Aircraft Operations**

#### ***Proposed Action***

The proposed THSF aircraft operations detailed below consist of LZ/DZ landings, which may occur within LU-1 and LU-2 areas. All activities must adhere to noted general and Proposed Resource-Specific Constraints and mitigations identified in Sections [2.5](#) and [3.6.4](#), respectively.

Prominent earth resources at THSF that exhibit characteristics potentially sensitive to LZ/DZ landings include sensitive karst areas, closed depressions, and hydric soils. Hydric soils compose 98 percent of THSF, and sensitive karst areas make up 55 percent. Because of the low, relatively flat terrain and extent of hydric soils and sensitive karst areas, most areas of THSF could be affected by landing/takeoff activities. Rutting damage to wet soils would likely be greatest in Ultisol and Inceptisol soils, which tend to have higher amounts of silt and/or clay in the topsoil, as well as Histosols, which have high amounts of organic matter. The depth of soil damage during landings could exceed 10 inches.

In karst areas, near-surface limestone solution pipes or caverns could be breached or otherwise damaged by landing wheels. Since surface indicators of susceptible solution pipes or caverns are usually absent, it is assumed these formations could be present within all affected TAs where karst occurs. Closed depressions are often early indicators of karst sinkhole formation. As with wet hydric soils, the contact point footprints would affect a small area and the infrequent occurrences and distribution of aircraft landing events at various THSF locations would minimize repetitive impacts.

Based on analyses presented in Section [3.6](#), THSF LZ suitability and limitation constraint areas are summarized in [Table 6-28](#) and [Figure 6-38](#). Very limited areas fall under the LU-1 category and would be limited in use for LZs/DZs.

Again, with the implementation of mitigations specific to earth resources (see Section [3.6.4](#)), potential soil erosion, compaction, and rutting impacts from proposed LZ/DZ use at THSF are anticipated to be adverse but insignificant, site-specific, low intensity, and short term because LZs/DZs would be rotated over time. No loss or degradation of prime farmland, karst soils, geologic steephead, or closed depression features is anticipated. Since no disturbance of wetlands is proposed within the estimated footprint area, federal or state wetland permits are not required.

**Table 6-28. Landing Zone Constraint Areas<sup>1</sup>**

Tactical Area (TA)	Constraint Area (acres)		Total Area (acres)
	Not Limited	Somewhat Limited	
Sumatra (TA-1)	7,675	7,141	14,816
Juniper Creek (TA-2)	15,379	15,874	31,253
Womack Creek (TA-3)	6,999	6,909	13,908
Whiskey George (TA-4)	17,595	7,190	24,785
New River (TA-5)	17,489	11,652	29,141
Picketts Bay (TA-6)	6,658	10,087	16,745
Crooked River (TA-7)	8,541	4,757	13,298
Deep Creek (TA-8)	12,032	4,497	16,529
Trout Creek (TA-9)	11,454	9,575	21,029
High Bluff (TA-10)	15,626	7,148	22,774
<b>Total</b>	<b>119,448</b>	<b>84,830</b>	<b>204,278</b>

1. Total area does not include pits, water, urban lands, Aquents, gullied lands, and other variants.

**Figure 6-38. THSF Landing Zone Constraint Areas**

### *Subalternative 1 (Preferred Alternative)*

Impacts would be similar to those described under the Proposed Action, although on a lesser scale due to the reduced level of proposed activity. LZ/DZ constraint areas associated with individual LZs/DZs are shown in [Figure 6-39](#) through [Figure 6-41](#). Only LZ/DZ TH2 is located in an area classified as somewhat limited, which is associated with the LU-2 constraint classification; these soils have features that are moderately favorable for the specified use. Limitations can be overcome or minimized by implementation of the constraints identified in [Section 2.5](#) associated with LU-2 areas.

**Figure 6-39. LZ/DZ Constraint Areas – TH2****Figure 6-40. LZ/DZ Constraint Areas – TH4****Figure 6-41. LZ/DZ Constraint Areas – TH6**

#### 6.6.2.4 Amphibious Operations

##### *Proposed Action*

Boat and troop egress and ingress activities would occur along the banks and shorelines of available training areas within all use areas (except prohibited areas and RAs), with noted General Operational Constraints and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [3.6.4](#), respectively. As discussed in Section [3.6](#), AO could disturb soils and trample vegetation, resulting in conditions that may result in accelerated bank erosion.

AO could destabilize streambanks and significantly increase soil loss and streambank retreat. On streambanks and shorelines with established vegetation and stable grades (not overheightened or oversteepened), impacts would consist of minor disturbances that, in most cases, would naturally recover. Operations conducted at boat launches would not likely increase streambank degradation or soil loss.

Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations, such as rotation of ingress/egress locations, would serve to minimize impacts to earth.

##### *Subalternative 1 (Preferred Alternative)*

Under Subalternative 1 there would be no amphibious operations; thus there would be no impact.

#### 6.6.3 Earth Resources Impact Summary

[Table 3-31](#) describes the context, intensity, and duration factors utilized for impacts to earth resources; based on these factors the Air Force has not identified insignificant adverse impacts to the natural environment. In summary, there are unavoidable adverse impacts associated with minor soil erosion resulting from LZ/DZ use, ground movement, and AO. No NPDES permitting requirements have been identified. The intensity of these impacts is minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Sections [2.5](#) and [3.6.4](#), respectively.

[Table 6-29](#) provides a summary of the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-29. Proposed Action/Subalternative 1 Earth Resource Impacts Summary by TA – THSF**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative.									
Land development										
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> Potential for soil compaction, rutting, and accelerated soil erosion associated with ISD on roadways. Vehicle use at water crossings could increase soil erosion and mobilization of streambed sediments. Additionally, soil/water contamination could result from fuels and other materials on roadways and in parking areas. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> Same as Proposed Action, with the potential for impact being less associated with the reduced level of proposed activity.									
Dismounted movement	<b>Proposed Action:</b> Negligible, short-term potential for soil compaction and accelerated soil erosion associated with trampling and incidental surface disturbance. Impacted areas would be expected to naturally recover. <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative, as well as the limited locations associated with ground movement.									
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Under Subalternative 1 expendable use would not occur; therefore there would be no impact.									
Smoke grenades										
Other/equipment										
Aircraft Operations	<b>Proposed Action:</b> Potential for soil compaction, rutting, accelerated soil erosion, and soil/water contamination from landing/takeoff activities and refueling activities. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> Same as Proposed Action, with potential for impacts being site specific and less possible due to the reduced level of proposed activity.									
Amphibious Operations	<b>Proposed Action:</b> Operations could further destabilize streambanks in some reaches of larger THSF streams with existing overheightened and oversteepened bank conditions, resulting in increased soil loss and streambank retreat. In streams with established vegetation and stable banks, minor disturbances would be expected to naturally recover. Operations at boat launches should not have any adverse effects. Implementation of General Operational Constraints and Proposed Resource-Specific Mitigations would minimize the extent of the impact. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impact.									
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse earth resource impacts associated with these activities (see Section 3.6). <b>Subalternative 1:</b> Same as Proposed Action. The potential for impact is appreciably less given the reduced level of activity proposed under this alternative.									

BMP = best management practice; GBS = ground burst simulator; ISD = incidental surface disturbance; THSF = Tate's Hell State Forest

### 6.6.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for earth resources have been identified as a result of analyses in this chapter. All General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations (Section 3.6.4) identified previously would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).



## 6.7 WATER RESOURCES

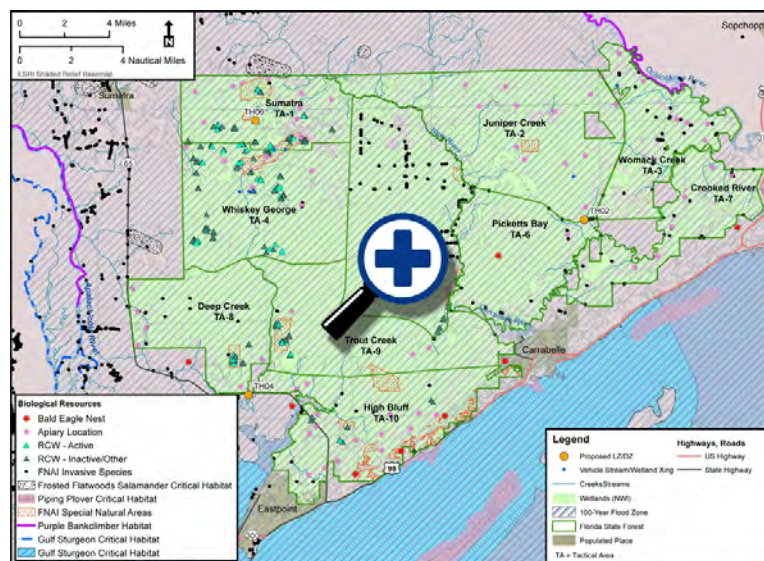
### 6.7.1 Affected Environment

Water resources at THSF include the watersheds of Ochlockonee River, New River and Whiskey George Creek, the Floridan aquifer, and extensive areas of wetlands and floodplains throughout the area.

#### 6.7.1.1 Surface Waters

##### *Proposed Action / Subalternative 1 (Preferred Alternative)*

[Figure 6-42](#) provides an overview of surface water resources associated with THSF. There are no surface waters associated with the proposed Subalternative 1 LZs/DZs.



**Figure 6-42. Water and Biological Resources at THSF – Overview**

THSF includes portions of three major watersheds: the Ochlockonee River, New River, and Whiskey George Creek (part of the Apalachicola River basin) (FDEP, 2001; FDEP, 2002). The eastern portion of THSF is part of the Ochlockonee River watershed; Crooked Creek is a major tributary of this watershed. The New River basin is the largest watershed in THSF. The tributaries that feed the New River include Juniper Creek (northeast of the New River), Gator Creek, Gully Branch, Trout Creek, Nero Branch, and an unnamed creek. The New River merges with the Crooked River to form the Carrabelle River and discharges into St. George Sound. Southwest of the Carrabelle River, runoff from some coastal areas of THSF discharges directly into St. George Sound. Whiskey George Creek is located west of New River, east of the Apalachicola River. Tributaries to Whiskey George Creek include Juniper Creek and Doyle Creek. Whiskey George Creek drains into the West Bayou of East Bay, which is part of Apalachicola Bay. FDEP classifies portions of the Ochlockonee River as an OWF. Several streams in THSF are listed as impaired by FDEP. [Table 6-30](#) lists impaired waters in the THSF and the impairment classification for each.

Since 1994, NFWFMD and FFS began acquiring the THSF property with the goal of restoring historical ecological communities and surface water drainage patterns to improve the quality of surface water discharged to the Apalachicola Bay system and surrounding waters (NFWFMD–FFS, 2010a; NFWFMD–FFS, 2010b). NFWFMD and FFS share responsibility for restoring and protecting THSF's hydrology and ecosystems. The overall goals of hydrologic restoration at THSF are to:

- Improve the water quality of surface water flows and runoff discharged to East Bay, Apalachicola Bay, and surrounding waters.
- Restore historical surface water drainage patterns.
- Enhance wetland hydrology and function.
- Restore a mix of native ecological communities.

**Table 6-30. Impaired Waters in THSF**

Group Name	Receiving Body of Water	Impaired Classification
Ochlockonee-St. Marks	Ochlockonee River <sup>1</sup>	Verified impaired due to mercury in fish
	Crooked River <sup>1</sup>	Verified impaired due to mercury in fish
Apalachicola-Chipola	New River	Verified impaired due to mercury in fish
	Cash Creek	Verified impaired due to bacteria in shellfish
	East River	Verified impaired due to bacteria in shellfish
	Doyle Creek	Verified impaired due to bacteria in shellfish
	Whiskey George Creek	Verified impaired due to bacteria in shellfish
	Crooked River <sup>1</sup>	Verified impaired due to mercury in fish and fish consumption advisory
	Direct runoff to bay	Verified impaired due to bacteria in shellfish and mercury in fish
	East Bayou	Verified impaired due to bacteria in shellfish and mercury in fish
	East Bay	Verified impaired due to evidence of fecal coliform, bacteria in shellfish, and mercury in fish

\* Classified as 303d impaired waters

### 6.7.1.2 Wetlands

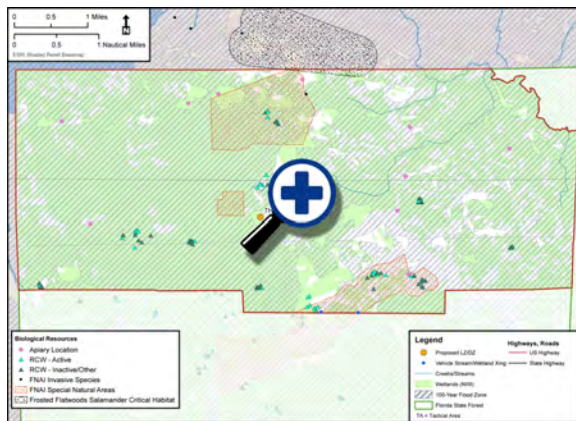
#### *Proposed Action*

Wetlands at THSF are spread extensively throughout the area. There are 181,476 acres of wetlands at THSF, including nearly 179,949 acres of palustrine or freshwater wetlands, 1,300 acres of estuarine wetlands, 44 acres of lacustrine wetlands, and 183 acres of riverine wetlands ([Table 6-31](#)). Palustrine or freshwater wetlands include forested wetlands, scrub-shrub wetlands, emergent wetlands, and ponds. Lacustrine wetlands include deepwater habitat (depths greater than 6.6 feet) associated with lakes. Estuarine wetlands consist of vegetated or unvegetated tidal wetlands in areas that are permanently submerged or periodically exposed during low tides. Riverine wetlands occur entirely within stream channels of tidal and nontidal, low-gradient, perennial streams (Cowardin et al., 1979).

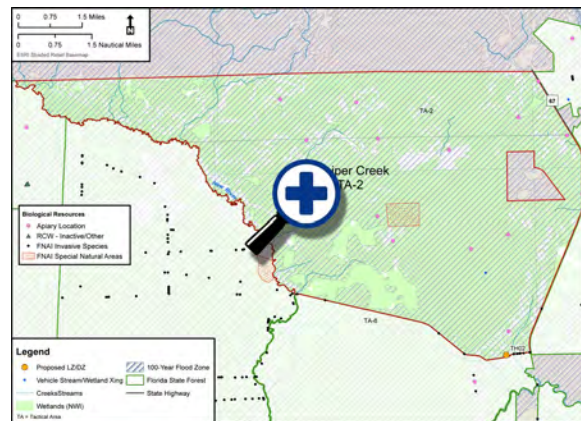
Figure 6-42 provides an overview of wetlands at Figure 6-43 through Figure 6-52 provide more detailed views of wetlands in each TA at THSF.

**Table 6-31. Wetlands Summary for THSF (acres)**

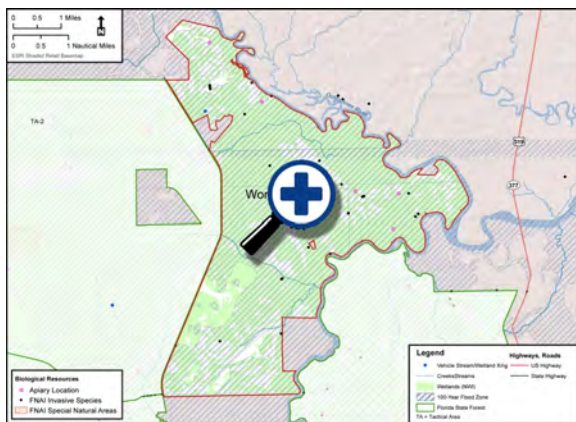
Wetland Type	Wetland Subtype	Tactical Area (TA)										Total
		1	2	3	4	5	6	7	8	9	10	
Palustrine	Forest	8,551	16,148	8,785	19,481	25,164	12,659	6,811	13,668	16,934	16,121	144,322
	Scrub-shrub	3,453	11,968	2,420	3,524	1,479	1,790	3,677	1,782	3,397	1,505	34,995
	Emergent	36		7		28	114	52			47	284
	Ponds	15		4		8	8	9		9	25	78
<b>Subtotal</b>		<b>12,055</b>	<b>28,116</b>	<b>11,216</b>	<b>23,005</b>	<b>26,679</b>	<b>14,751</b>	<b>10,549</b>	<b>15,540</b>	<b>20,340</b>	<b>17,698</b>	<b>179,949</b>
Riverine	Instream	1		154			10	18				183



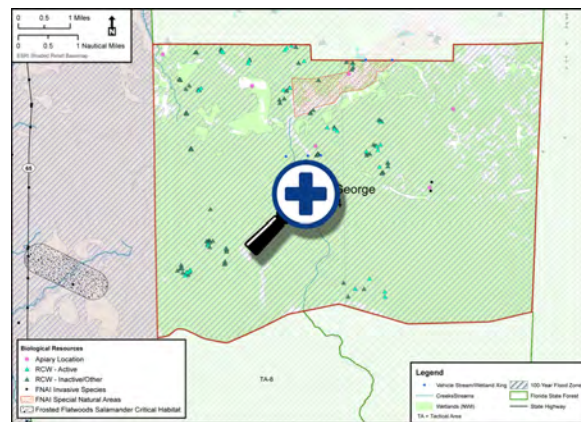
**Figure 6-43. Water and Biological Resources – TA-1 at THSF**



**Figure 6-44. Water and Biological Resources – TA-2 at THSF**



**Figure 6-45. Water and Biological Resources – TA-3 at THSF**

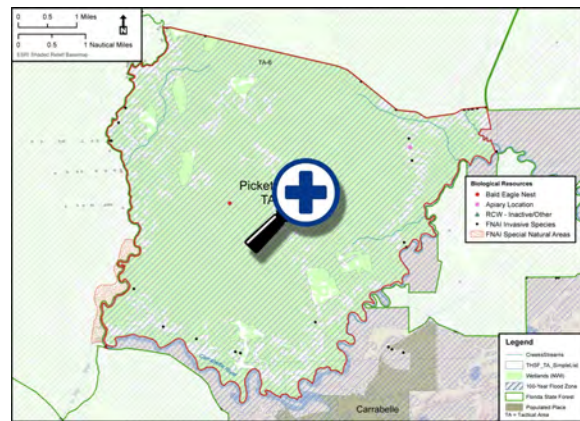


**Figure 6-46. Water and Biological Resources – TA-4 at THSF**





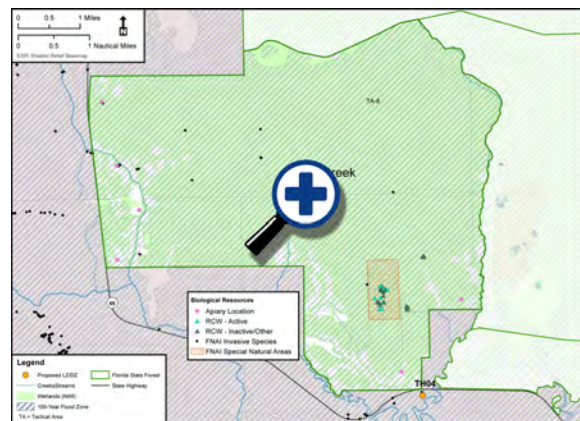
**Figure 6-47. Water and Biological Resources – TA-5 at THSF**



**Figure 6-48. Water and Biological Resources – TA-6 at THSF**



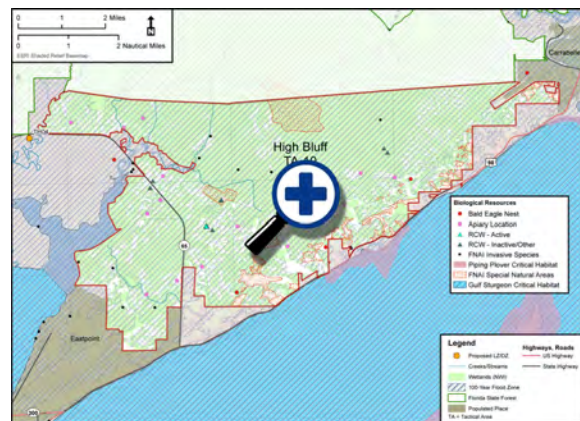
**Figure 6-49. Water and Biological Resources – TA-7 at THSF**



**Figure 6-50. Water and Biological Resources – TA-8 at THSF**



**Figure 6-51. Water and Biological Resources – TA-9 at THSF**



**Figure 6-52. Water and Biological Resources – TA-10 at THSF**

**Subalternative 1 (Preferred Alternative)**

Figure 6-53 through Figure 6-55 show the wetlands associated with the proposed LZs/DZs. TH2 consists of approximately 0.19 acres of wetlands, TH4 0.27 acres of wetlands, and TH6 0.21 acres of wetlands.



**Figure 6-53. THSF Water and Biological Resources – TH2**



**Figure 6-54. THSF Water and Biological Resources – TH4**



**Figure 6-55. THSF Water and Biological Resources – TH6**

### 6.7.1.3 Floodplains

#### Proposed Action

THSF is dominated by low-lying, poorly drained topography. As a result, floodplains are distributed extensively throughout the area. In all, 193,786 acres of floodplains have been mapped at THSF (Table 6-32). Figure 6-42 provides an overview of floodplains at THSF.

Figure 6-43 through Figure 6-52 provide more detailed views of the distribution of wetlands in each TA at THSF.

**Table 6-32. Floodplain Summary for THSF (acres)**

Tactical Area (TA)										
1	2	3	4	5	6	7	8	9	10	Total
13,226	29,243	14,756	23,560	28,461	16,075	11,767	16,133	20,253	20,312	193,786



### ***Subalternative 1 (Preferred Alternative)***

[Figure 6-53](#) through [Figure 6-55](#) show the floodplains associated with the proposed LZs/DZs. TH2 consists of approximately two acres of floodplain, TH4 one acre of floodplain, and TH6 is not within a floodplain.

## **6.7.2 Environmental Consequences**

As discussed in Section [3.7](#), potential adverse impacts to water resources may occur from use of wheeled vehicles, dismounted maneuvers, and AO. Other Proposed Action effectors are not addressed in this section. Impacts to THSF water resources identified in Section [6.7.1](#) would generally be the same as those described in Section [3.7](#). Impact assessment considers implementation of the General Operational Constraints inherent to the Proposed Action as identified in Section [2.5](#). These constraints, such as establishment of buffers around sensitive water resource locations and habitats, would minimize potentially adverse impacts and, in some cases, avoid adverse impacts altogether. Avoidance areas for water resources are identified in [Figure 6-1](#) through [Figure 6-11](#).

### **6.7.2.1 Water Resource Protection Levels**

#### ***Proposed Action / Subalternative 1 (Preferred Alternative)***

Water resource protection levels were defined based on current environmental management requirements at Eglin AFB (EAFBI 13-212; U.S. Air Force, 2012). Water resources fall within the LU-1 protection level as described in Section [5.1](#) and shown in [Figure 6-1](#) through [Figure 6-11](#) as solid yellow. The LU-1 protection level would affect all surface water bodies (streams, ponds, and lakes), wetlands, and floodplains and a 100-foot buffer zone around these resources. No land disturbance would be permitted outside of previously disturbed roadbeds and road shoulders. Dismounted maneuvers and AO would be allowed, but concentrated troop movements would not be allowed on steep slopes, streambanks/shorelines, and wetlands. Pyrotechnic use in wetlands at THSF would be limited only to star clusters.

Wheeled vehicle use would be restricted to existing, approved roads and trails in each TA. Wheeled vehicle use of stream and wetland crossings would be restricted to FFS-identified crossings at THSF. Data on stream and wetland crossing conditions for THSF are unavailable from the FFS. For purposes of analysis, each crossing was assumed to be in fair condition; however, prior to use the Air Force would coordinate with the FFS to evaluate each crossing and determine its relative condition to determine whether the crossing is “good,” “fair,” or “poor.” Vehicle access would be prohibited at stream and wetland crossings rated in poor condition. [Table 6-33](#) summarizes the stream and wetland crossings at each TA at THSF, while [Figure 6-1](#) through [Figure 6-11](#) show their locations. Each crossing is shown in light blue.

**Table 6-33. Stream/Wetland Road Crossing Condition Summary, THSF**

Surface Water/Wetland	Crossing Condition <sup>1</sup>	Tactical Area										Total
		1	2	3	4	5	6	7	8	9	10	
	Fair	2	1	1	3	0	0	0	0	0	0	7

1. Data on stream and wetland crossing conditions for THSF are unavailable from the FFS. For purposes of analysis, each crossing was assumed to be in fair condition.

Restrictions under the LU-1 protection level would prevent any land development activities or ground disturbance activities on a total of 202,264 acres or 98.75 percent of THSF (see [Table 6-34](#)). These restrictions in each TA range from 12,975 acres to 31,207 acres (95.95 percent to 99.92 percent of each TA). [Figure 6-1](#) through [Figure 6-11](#) provide more detailed views of water resource avoidance areas in each TA at THSF. LU-1 areas are identified in each figure as solid yellow.

**Table 6-34. Water Resource Protection Level Summary, THSF**

Protection Level	Tactical Area										Total
	1	2	3	4	5	6	7	8	9	10	
LU-1 (acres)	14,498	31,207	13,725	24,572	29,110	16,734	12,975	16,455	21,015	21,973	202,264
% area affected	97.77	99.58	97.95	99.14	99.74	99.22	97.29	99.54	99.92	95.95	98.75

LU-1 = Limited Use 1

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, while the three proposed LZs/DZs do contain portions of wetlands it is important to note that these LZs/DZs are currently operational LZs/DZs used by the FFS, and the landing portion of these LZs/DZs are not actually located in wetland areas. The use of these existing LZs/DZs would not result in any adverse impacts to wetlands.

### **6.7.2.2 Ground Movement**

Wheeled vehicle use and CCDM could affect water resources at THSF.

#### ***Proposed Action***

##### Wheeled Vehicle Use

Wheeled vehicle use would not directly affect surface water resources, since vehicles would not be allowed direct access to any surface waters or wetlands under the LU-1 protection level. Vehicle use would be restricted to existing roads and trails and approved, existing crossing locations in streams and wetlands.

Wheeled vehicle activities could indirectly affect water resources at THSF. Routine use of the existing dirt road network at THSF that extends throughout the TAs is a regular contributor to roadway erosion, and a recognized problem affecting some streams and wetlands (FDOF, 2000). Leaks of fuel and other vehicle fluids would also be a potential indirect source of contamination to water resources as described under land improvement effects. Some indirect effects to water resources from roadway erosion are likely and assumed to occur. While the potential for these occurrences are inherent to vehicle use (whether for the military, the FFS, or civilians) and unavoidable, implementation of standard vehicle maintenance and spill prevention SOPs would minimize the potential for occurrence to a negligible level.

##### Dismounted Movements

Dismounted troop movement could impact surface water and wetland resources in all TAs at THSF. Potential effects would be direct but minor. Rotation of any stream or water body ingress/egress areas would minimize the potential for any medium- to long-term impacts associated with shoreline erosion, and units would be advised to avoid any noticeably eroded shorelines. Over the short term, sediments in the fast-flowing

streams typical of those found at THSF would settle rapidly and water clarity would return, causing the streams to return to their former state once units move out of the area.

#### ***Subalternative 1 (Preferred Alternative)***

Impacts would generally be the same as described under the Proposed Action, with less potential for impact associated with the reduced level of activity. While dismounted movement may still occur within THSF the amount of activity is greatly reduced under the Subalternative, and the use of already-established FFS LZs/DZs would minimize any potential impacts to wetland areas.

### **6.7.2.3 Amphibious Operations**

#### ***Proposed Action***

AO could impact surface waters and wetland resources in TA-10 (High Bluff) at THSF. As discussed in Section [3.7](#), AO could result in disturbance of streambeds and shorelines from the loading and unloading of watercraft and movement of watercraft on the surface waters, as well as ingress/egress of troops over the land/water interface as discussed in detail in the *Riverine/Estuarine Programmatic Environmental Assessment* (U.S. Air Force, 2004). AO would adhere to the General Operational Constraints and mitigations identified in Section [2.6](#) associated with EAFBI 13-212, Section 7.2.9. Impacts to water resources would be minimized to levels less than significant by limiting activity to designated landing zones and rotating landing zones when these areas show signs of erosion. Fuel could be released from watercraft to surface waters, however, this is inherent to watercraft use (whether military or civilian). Such potential for adverse impacts are minimized to a negligible level by implementation of SOPs for watercraft maintenance and spill prevention procedures, as identified in Section [3.12](#).

#### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, there would be no amphibious operations; thus there would be no associated impacts.

### **6.7.3 Water Resources Impact Summary**

[Table 3-36](#) describes the context, intensity, and duration factors utilized in analysis for impacts to water resources; based on these factors the Air Force has identified insignificant adverse impacts to water resources. In summary, there are unavoidable, direct, adverse impacts to wetlands from ISDs associated with ground movement and AO. However, these impacts would be minimized through implementation of General Operational Constraints and Proposed Resource-Specific Mitigations identified in Section [2.5](#) and [3.7.4](#), respectively. Water quality impacts would not be expected to impact public health or safety. No USACE Section 404 permitting requirements have been identified.

[Table 6-35](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-35. Proposed Action/Subalternative 1 Surface Water and Wetland Impacts Summary – THSF**

Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity. Consumption would not occur under this alternative.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> Floodplains would not be affected. However, while wheeled vehicles would be required to utilize existing and approved roadways and water and wetland crossings, unavoidable adverse impacts to surface waters and wetlands may occur from wheeled vehicles at water/wetland crossings. Minor impacts may be associated with indirect impacts from oil drips, etc., from vehicles. Mitigations to prevent environmental damage, as described in Section 3.7.4, include use of only stream crossings rated “good” or “fair” for training exercises and avoiding use of crossings rated “poor.” Leaks of vehicle fluids would be mitigated through proper vehicle maintenance and spill kits for field use. Implementation of these mitigations and constraints would minimize the potential for impacts from “yellow” to “green” by decreasing the potential for vehicle interaction with degraded resources and the potential for any spills to occur. <b>Subalternative 1:</b> Impacts would generally be the same as the Proposed Action, with the potential for impacts reduced associated with the reduced level of activity under Subalternative 1.									
Dismounted movement	Floodplains would not be affected. There is a potential for localized disturbance to shoreline and wetland vegetation (e.g., trampling) from personnel. This would be minor and recoverable over the short term. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.6 (such as frequently rotating tactical area use and minimizing unit size) would result in reduction of adverse impacts from “yellow” to “green” by minimizing the potential for excessive trampling and allowing natural recovery processes. <b>Subalternative 1:</b> Impacts would generally be the same as the Proposed Action, with the potential for impacts reduced associated with the reduced level of activity under Subalternative 1.									
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Expendable use would not occur under Subalternative 1; thus there would be no impact.									
Smoke grenades										
Other/equipment										
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.									
Amphibious Operations	<b>Proposed Action:</b> Floodplains would not be affected. Boat landings and nearshore activities could result in shoreline erosion in streams and rivers. Activities in estuarine areas could affect wetlands, as could water-land transition actions. These impacts would be adverse, but they would be localized and recoverable over the short term under natural processes. Implementation of general and activity-specific operational constraints and mitigations as described in Section 2.6 (such as using only designated ingress/egress points and rotating water/land transition areas) would result in reduction of adverse impacts from “yellow” to “green” by minimizing the potential for erosion, allowing natural recovery processes. <b>Subalternative 1:</b> This activity would not occur; therefore there would be no impacts.									
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse water resource impacts associated with these activities (see Section 3.7). <b>Subalternative 1:</b> Same as Proposed Action, with potential for impact less than the Proposed Action given the reduced level of proposed activity.									

### 6.7.4 Proposed Resource-Specific Mitigations

The USFWS, as part of the ESA Section 7 consultation process (USFWS, 2014), has recommended the following conservation measure: avoidance of “Good” and “Poor” rated vehicle water crossings for training use in order to protect the better crossing sites and minimize further degradation of the sites in poor condition.

No additional Resource-Specific Mitigations for water resources have been identified. All General Operational Constraints (Section 2.5) and Proposed Resource-Specific Mitigations (Section 3.7.4) identified previously would sufficiently minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 6.8 BIOLOGICAL RESOURCES

### 6.8.1 Affected Environment

Figure 6-42 provides an overview of biological resources at THSF. Figure 6-43 through Figure 6-52 provide more detailed views of biological resources in each TA at THSF. Figure 6-53 through Figure 6-55 identify more detailed views of biological resources relative to the proposed LZ/DZ sites under Subalternative 1.

#### 6.8.1.1 Vegetation

##### *Proposed Action/Subalternative 1 (Preferred Alternative)*

Descriptions of vegetation within THSF are based on ecological community categories used by the Florida Natural Area Inventory and the FFS. Table 6-36 lists representative vegetation species within each ecological community.

**Table 6-36. Ecological Communities Within THSF**

Community	Description
Sand pine scrub	Occurs on well-drained soils on relict coastal dune ridges. Sand pine ( <i>Pinus clausa choctawhatchee</i> ) dominates the canopy. Other species include shrubs such as myrtle oak ( <i>Quercus myrtifolia</i> ), sand live oak ( <i>Quercus geminata</i> ), saw palmetto ( <i>Serenoa repens</i> ), and Florida rosemary ( <i>Ceratiola ericoides</i> ), and lichens are common groundcover. Most sand pine scrub areas in THSF are undisturbed.
Mesic flatwoods	Occurs on moderately drained sandy soils. Most natural areas of mesic flatwoods in THSF were converted to stands of slash pine plantation, but restoration efforts to reestablish the historical longleaf pine are under way. Other plant species included a low dense groundcover of wiregrass ( <i>Aristida stricta</i> ), Florida dropseed ( <i>Sporobolus floridanus</i> ) bracken fern ( <i>Pteridium aquilinum</i> ), saw palmetto, and other low shrubs and grasses.
Wet/mesic flatwoods	Occur on poorly drained soils. Most natural areas of wet/mesic flatwoods have been converted to planted pine. Fire suppression has allowed titi shrubs to establish a dense mid-story, which under natural conditions would not exist. Wet/mesic flatwoods naturally have a widely spaced canopy of slash, pond, or longleaf pine and a grassy or shrubby understory consisting of titi ( <i>Cliftonia monophylla</i> and <i>Cyrilla racemiflora</i> ), sweet gallberry ( <i>Ilex coriacea</i> ), bitter gallberry ( <i>Ilex gabra</i> ), and St. John's wort ( <i>Hypericum</i> spp.). Groundcover species include wiregrass, beakrashes ( <i>Rhynchospora</i> spp.), panic grasses ( <i>Panicum</i> spp.), nutrushes ( <i>Sceleria</i> spp.), and sundews ( <i>Drosera</i> spp.).
Wet savannas	Occur on poorly drained soils. Serve as transition areas between wet flatwoods and deciduous or mixed forested wetlands. Grassy open areas with few trees. Seasonally saturated and often contain rare plants such as pitcher plants ( <i>Sarracenia</i> spp.), dew-threads ( <i>Drosera tracyi</i> ), and grass-pink orchids ( <i>Calopogon</i> spp.). In THSF, most of these areas were converted to slash pine plantation. The Florida Division of Forestry has begun restoring wet savannas through a program of thinning planted pines, applying prescribed burns, and re-creating historical drainage patterns.



**Table 6-36. Ecological Communities Within THSF, Cont'd**

Community	Description
Wet savanna – cypress flats	Occurs on poorly drained soils. Savanna-type habitats with widely separated pond cypress ( <i>Taxodium ascendens</i> ) and slash pine with a shrub/small cypress mid-story. Fire suppression fosters growth and invasion and domination of titi and other shrubs. Forest road and ditch removal and reestablishment of historical drainage patterns are measures employed to restore this habitat type.
Basin swamps/shrub and mixed forested wetlands	A mix of wetland types that occur on poorly drained soils and in depressional features of low topography. May be inundated at times throughout the year. Mixed pond cypress—titi forests, shrub wetlands, Atlantic White Cedar ( <i>Chamaecyparis thyoides</i> ) swamps, black gum ( <i>Nyssa biflora</i> )—bay forests, slash pine/cypress/bay swamps, and other mixtures of canopy trees and shrubs are common. Fire suppression has led to natural vegetation becoming dense and overgrown.
Shrub wetlands	Occur on poorly drained soils. Dominated by black titi ( <i>Cliftonia monophylla</i> ), white titi ( <i>Cyrilla racemiflora</i> ), and gallberry. Overgrowth results without fire suppression. Large areas of remnant shrub wetlands are found east of State Road 67 in THSF.
Deciduous forested wetlands	Occur on poorly drained soil, with standing water present for much of the year. Includes cypress sloughs, dwarf cypress swamps, riverine bald cypress ( <i>Taxodium distichum</i> ) swamps, and smaller forested wetlands having canopies of pond cypress ( <i>Taxodium ascendens</i> ), red maple ( <i>Acer rubrum</i> ), tulip tree ( <i>Liriodendron tulipifera</i> ), or black gum. Dwarf cypress trees are unique due to their stunted height of only 15 feet; however, they can live more than 300 years.
Marshes	Water present usually year-round, fluctuating with tidal or rainfall cycles. Associated with lower reaches of New, Carabelle, and Crooked Rivers and Whiskey George and Cash Creeks; also present as isolated marshes within THSF. May be fresh or brackish. Typical vegetation of riverine marshes includes sawgrass ( <i>Cladium jamaicense</i> ), black needle rush ( <i>Juncus roemerianus</i> ), and salt cordgrass ( <i>Spartina alterniflora</i> ). Typical vegetation in isolated freshwater marshes includes grasses, rushes, sedges, herbaceous plants, and floating aquatics.

Source: FNAI, 2010; FDACS, 2007

THSF = Tate's Hell State Forest

### 6.8.1.2 Wildlife

#### **Proposed Action/Subalternative 1 (Preferred Alternative)**

THSF is a WMA. Its game species are regulated and managed by the FWC. In addition to protected wildlife species discussed in Section 6.8.1.3, THSF support numerous other wildlife species, including mammals, birds, fish, reptiles, and amphibians. Mammals include raccoons (*Procyon lotor*), coyotes (*Canis latrans*), river otters (*Lutra canadensis*), and white-tailed deer (*Odocoileus virginianus*). Birds include eastern wild turkey (*Meleagris gallopavo silvestris*), several species of sparrows, raptors, wading birds, and ducks (FWC, 2013b). The Deep Creek Tract and High Bluff Coastal Trail, two segments of the Great Florida Birding Trail, are located in TA-8 and TA-10 respectively. Several other trails and tracts of the Great Florida Birding Trail can be found adjacent to THSF (FWC, 2014). In the fall and winter, almost 90 different migratory bird species may visit THSF (NFWFMD-FFS, 2010a; NFWFMD-FFS, 2010b). Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703–712) and EO 913186. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during the annual life cycle. Federal agencies are to integrate bird conservation principles, measures, and practices into agency activities and avoid or minimize adverse impacts on migratory bird resources. Also, federal agencies must notify the USFWS in advance of conducting an action that is intended to take migratory birds. The American alligator (*Alligator mississippiensis*) and Florida cottonmouth (*Agkistrodon piscivorus conanti*) are notable reptiles. Amphibians include frogs, toads, and salamanders.

Black bears also frequent THSF. The FWC Site for the East Panhandle Bear Management Unit (BMU), which includes THSF, reported that in 2002 an estimated 411 to 653 bears were living in this BMU (FWC, 2012). The East Panhandle Area covers eight counties and over 5 million acres, with THSF accounting for just 3.5 percent of the BMU (FWC, 2012). According to the FWC Bear Management Plan, the Apalachicola subpopulation associated with the West Panhandle BMU has an estimated density of 4,140 acres per bear, which means that the bear population at THSF would be approximately 50 individuals. Eglin's population is of comparable size with approximately 80 individuals. No major issues attributable to military activity have been observed with Eglin's bear population.

There are several apiary (bee-keeping) operations throughout THSF. [Table 6-37](#) lists numbers of apiary operations associated with the tactical areas.

**Table 6-37. Presence of Apiaries Within THSF Tactical Areas**

Number of Apiaries	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
	10	13	6	6	0	1	6	6	3	16

### 6.8.1.3 Protected Species

#### *Proposed Action/Subalternative 1 (Preferred Alternative)*

There are six animals federally listed under the ESA and three federally listed ESA plant species within THSF or in waters adjacent to the TAs. Additionally, the bald eagle is afforded protection under the BEPA, and bottlenose dolphins, which occur in waters adjacent to TA-10, have federal protection under the MMPA. Potential impacts from the Proposed Action to federally listed species would require the Air Force to consult with the USFWS, who would then decide whether to issue a biological opinion with terms and conditions for minimizing impacts to federally protected species. As there is a low potential for amphibious operations to adversely interact with bottlenose dolphins, a consultation with the National Marine Fisheries Service (NMFS) would not be required. All federally listed and state-listed species known to occur or with the potential to occur within THSF are provided in [Table 6-38](#). Some bird and wildlife species have the potential to occur throughout several TAs within THSF, depending on habitat associations and feeding habits. Currently there is one documented bald eagle nest in TA-6 and three documented nests in TA-10. Plant species with a recorded occurrence within a particular TA are noted as confirmed in [Table 6-38](#).

**Table 6-38. Protected Species Known or Potentially Occurring in THSF**

Species <sup>1</sup>	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
●=Confirmed present; ○=Not present; ◻=Potential to occur										
<b>Molluscs</b>										
Purple bankclimber mussel ( <i>Elliptioideus sloatianus</i> ) FT/ST	○	○	● <sup>2</sup>	○	○	○	○	○	○	○
<b>Amphibians</b>										
Frosted flatwoods salamander ( <i>Ambystoma cingulatum</i> ) FT/SSC	● <sup>3</sup>	○	○	○	○	○	○	○	●	●
Gopher frog ( <i>Rana capito</i> )	◻	◻	◻	◻	◻	◻	◻	◻	◻	◻

**Table 6-38. Protected Species Known or Potentially Occurring in THSF, Cont'd**

Species <sup>1</sup>	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
N/SSC										
<b>Reptiles</b>										
American alligator ( <i>Alligator mississippiensis</i> ) FSA/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Eastern indigo snake ( <i>Drymarchon corais couperi</i> ) FT/ST	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Gopher tortoise ( <i>Gopherus polymerus</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Alligator snapping turtle ( <i>Macrochelys temminckii</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Florida pine snake ( <i>Pituophis melanoleucus mugitus</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
<b>Mammals</b>										
Florida mouse ( <i>Peromyscus floridanus</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Florida black bear ( <i>Ursus americanus floridanus</i> ) N/ST	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Sherman's fox squirrel ( <i>Sciurus niger shermani</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Bottlenose dolphin ( <i>Tursiops truncatus</i> ) MMPA	○	○	○	○	○	○	○	○	○	●
<b>Birds</b>										
Scott's seaside sparrow ( <i>Ammodramus maritimus peninsulae</i> ) N/SSC	○	○	○	○	○	○	○	○	○	☑
Limpkin ( <i>Aramus guarauna</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Little blue heron ( <i>Egretta caerulea</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Reddish egret ( <i>Egretta rufescens</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Snowy egret ( <i>Egretta thula</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Tricolored heron ( <i>Egretta tricolor</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
White ibis ( <i>Eudocimus albus</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Southeastern American kestrel ( <i>Falco sparverius paulus</i> ) N/ST	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Bald eagle ( <i>Haliaeetus leucocephalus</i> ) BEPA	☑	☑	☑	☑	☑	●	☑	☑	☑	●
Woodstork ( <i>Mycteria americana</i> ) FE/SE	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Osprey ( <i>Pandion haliaetus</i> ) N/SSC	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Red-cockaded woodpecker ( <i>Picoides borealis</i> ) FE/SSC	●	○	○	●	●	○	○	●	●	●
<b>Fish</b>										
Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> ) FT/ST	○	○	○	○	○	○	○	○	○	●

**Table 6-38. Protected Species Known or Potentially Occurring in THSF, Cont'd**

Species <sup>1</sup>	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Shoal bass ( <i>Micropterus cataractae</i> ) N/SSC	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Plants										
Narrow-leaved bluestem ( <i>Andropogon arctatus</i> ) N/ST	●	☐	☐	●	●	☐	☐	☐	☐	☐
Southern milkweed ( <i>Asclepias viridula</i> ) N/ST	●	☐	☐	☐	☐	☐	☐	☐	☐	☐
Scareweed ( <i>Baptisia simplicifolia</i> ) N/ST	●	☐	☐	☐	☐	☐	☐	☐	☐	☐
Spoon-leaved sundew ( <i>Drosera intermedia</i> ) N/ST	☐	●	☐	☐	☐	☐	☐	●	☐	☐
Wiregrass gentian ( <i>Gentiana pennelliana</i> ) N/SE	☐	☐	☐	☐	●	☐	☐	☐	☐	☐
Henry's spider lily ( <i>Hymenocallis henryae</i> ) N/SE	●	☐	☐	●	☐	☐	☐	☐	☐	☐
Water willow ( <i>Justicia crassifolia</i> ) N/SE	●	☐	☐	☐	☐	☐	☐	☐	☐	☐
Godfrey's blazing star ( <i>Liatris provincialis</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	●
West's flax ( <i>Linum westii</i> ) N/SE	☐	●	☐	☐	●	☐	☐	☐	☐	☐
Gulf coast lupine ( <i>Lupinus westianus</i> ) N/ST	○	○	○	○	○	○	○	○	○	●
Curtiss loosestrife ( <i>Lythrum curtissii</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	●
White birds-in-a-nest ( <i>Macbridea alba</i> ) FT/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hummingbird flower ( <i>Macranthera flammea</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Florida beargrass ( <i>Nolina atopocarpa</i> ) N/ST	☐	☐	☐	●	●	☐	☐	☐	☐	☐
Carolina grass-of-parnassus ( <i>Parnassia caroliniana</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pinewood false sunflower ( <i>Pheobanthus tenuifolia</i> ) N/ST	☐	☐	☐	☐	☐	☐	☐	☐	☐	●
Apalachicola dragonhead ( <i>Physotegia godfreyi</i> ) N/ST	●	☐	☐	☐	●	☐	☐	☐	☐	☐
Godfrey's butterwort ( <i>Pinguicula ionantha</i> ) FT/SE	●	●	☐	●	●	☐	☐	☐	●	●
Large-leaved jointweed ( <i>Polygonella macrophylla</i> ) N/ST	○	○	○	○	○	○	○	○	○	●
Small flowered meadowbeauty ( <i>Rhexia parviflora</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Narrow-leaved beakrush ( <i>Rhynchospora stenophylla</i> ) N/ST	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Night flowering petunia ( <i>Ruellia noctiflora</i> ) N/SE	●	●	☐	☐	●	☐	☐	☐	☐	●
White-top pitcher plant ( <i>Sarracenia leucophylla</i> ) N/SE	☐	☐	☐	☐	☐	☐	☐	●	●	●
Florida skullcap ( <i>Scutellaria floridana</i> ) FT/SE	☐	☐	☐	☐	☐	☐	☐	●	☐	☐

**Table 6-38. Protected Species Known or Potentially Occurring in THSF, Cont'd**

Species <sup>1</sup>	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10

Source: FNAI, 2013b; FDACS, 2007

BEPA = Bald Eagle Protection Act; FSA = federally listed due to similarity of appearance; FT = federally threatened; MMPA = Marine Mammal Protection Act; N = no status; SSC = state species of concern; ST = state threatened

●=Confirmed present; ○=Not present; ◐=Potential to occur

1. Descriptions of most species can be found at <http://fnai.org/bioticssearch.cfm>.

2. Critical habitat occurs within TA-3.

3. Critical habitat occurs within and adjacent to TA-1.

#### 6.8.1.4 Sensitive Habitats

##### *Proposed Action/Subalternative 1 (Preferred Alternative)*

The Florida Natural Areas Inventory has identified high-quality sensitive habitats within THSF. The combined acreages of sensitive habitats within TAs are listed in [Table 6-39](#) and depicted in [Figure 6-42](#) through [Figure 6-52](#). Piping plover and Gulf sturgeon critical habitat occur on TA-10 or within adjacent waters (CFR, 2001, 2003). Critical habitat for the purple bankclimber mussel occurs on TA-3, and critical habitat for the frosted flatwood salamander occurs within and adjacent to TA-1 (CFR, 2007, 2009).

**Table 6-39. Occurrence of Sensitive Habitats Within THSF Tactical Areas**

Sensitive Habitat Type <sup>1</sup>	Tactical Area (TA) (acres)									
	1	2	3	4	5	6	7	8	9	10
Wet prairie	813	253	0	326	0	577	0			
Mesic flatwoods	0									287
Wet flatwoods/strand swamp	401	0	589	0	307	0				
Basin swamp	0								138	499
Scrub	0									712

Source: FFS, 2012b

1. Descriptions of habitats can be found in [Table 6-36](#) and at [http://www.fnai.org/pdf/Natcom\\_shortdesc\\_Nov2010.pdf](http://www.fnai.org/pdf/Natcom_shortdesc_Nov2010.pdf) (FNAI, 2010).

#### 6.8.1.5 Invasive Species

##### *Proposed Action/Subalternative 1 (Preferred Alternative)*

[Table 6-40](#) lists the numbers of documented invasive plant species locations within the TAs. Invasive species have the potential to compete with and displace native species. The locations correspond to the invasive species points shown on [Figure 6-42](#) through [Figure 6-52](#).

**Table 6-40. Tactical Areas with Invasive Species**

Invasive Species	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Documented occurrence (number of locations)	1	8	28	2	>100	24	21	12	4	7

Source: FNAI, 2011



## 6.8.2 Environmental Consequences

As discussed in Section 3.8, potential adverse impacts to biological resources may occur from dismounted maneuvers, UoEX, and aircraft and AO. Other effectors are not addressed in this section. The general analysis presented in Section 3.8 covers potential impacts to affected environment resources identified in Section 6.8.1.

Impact assessment considers implementation of the General Operational Constraints inherent to both the Proposed Action and Subalternative 1 as identified in Section 2.5. These constraints, such as establishment of buffers around sensitive species locations and habitat, serve to minimize potentially adverse impacts and, in some cases, avoid adverse impacts altogether. Avoidance areas for biological resources are identified in Figure 6-1 through Figure 6-11 and Figure 6-12 through Figure 6-22. General Operational Constraints identified in Section 2.5 requires that all identified sensitive species locations and habitat would be protected, and aspects of EAFBI 13-212 and Eglin AFB sensitive species consultations would be implemented as part of the action alternatives.

Additionally, impact analyses rely heavily on analysis and results as presented in the *Interstitial Area Range Final Environmental Assessment Revision 2*, *Eglin AFB Interstitial Area Biological Assessment*, *Eglin AFB Red-Cockaded Woodpecker Programmatic Biological Opinion*, and the *Eglin AFB Estuarine/Riverine Biological Assessment*. These documents analyze potential impacts to resources on the Eglin Range from activities associated with the action alternatives. Impacts to THSF biological resources identified in Section 6.8.1 would be the same as those described in Section 3.8.

### 6.8.2.1 Vegetation

Table 6-41 lists impacts to vegetation in each TA for the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

**Table 6-41. Proposed Action/Subalternative 1 Vegetation Impacts by TA at THSF**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.									
Point impact										
Incidental Surface Disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									

**Table 6-41. Proposed Action/Subalternative 1 Vegetation Impacts by TA at THSF, Cont'd**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Dismounted movement	<b>Proposed Action:</b> Adverse impacts would be from incidental direct physical impact (trampling). The intensity of the impacts would be minimized given implementation of General Operational Constraints associated with regulating unit size and rotating use areas, thus allowing recovery of vegetation over the short term. <b>Subalternative 1:</b> Impacts would generally be the same as those for the Proposed Action, with less potential for impact due to the reduced level of proposed activity.									
Use Expendables										
Blanks/GBS	<b>Proposed Action:</b> Potential adverse impacts associated with increased wildfire potential from expendables and equipment usage. This increased potential would be unavoidable, and would persist over the long term. However, implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices would reduce the intensity of the impacts. <b>Subalternative 1:</b> Blanks/GBS and smoke grenade use would not occur in THSF.									
Smoke grenades										
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.									
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to vegetation associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.									
Amphibious Operations	<b>Proposed Action:</b> Potential adverse impacts to shoreline and aquatic vegetation due to trampling/rutting associated with landing of watercraft along shorelines. Impacts would be short term and recoverable through Operational Constraints such as rotation of established landing sites. <b>Subalternative 1:</b> Amphibious Operations would not occur in THSF.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

### **Proposed Action**

Most impacts to vegetation would be related to temporary disturbances, such as trampling associated with ground movements, landing of aircraft, or minor ground disturbance, and would be recoverable through natural processes.

Potential wildfires resulting from expendables would impact THSF ecological communities. Generally, controlled fire can be beneficial to ecological communities and species by maintaining the grassy understory and preventing mid-story encroachment. However, wildfires can damage the habitats of species that rely on these communities. According to the *Final Environmental Assessment for the Eglin AFB Integrated Natural Resource Management Plan Activities*, Eglin averages 110 wildfires annually, with an average size of 60 acres; the majority of these wildfires are due to mission activities, primarily ordnance and pyrotechnics use (U.S. Air Force, 2013a). By comparison, THSF averages four wildfires annually, with an average size of 40 acres (FDACS, 2007). The FFS utilizes a fire management program that includes wildfire prevention, detection and suppression, and prescribed burning. Adherence to FFS and Eglin fire management procedures as outlined in Section 2.5 would serve to minimize wildfire occurrence. As a result the Air Force does not consider this potential to be significant.

### **Subalternative 1 (Preferred Alternative)**

Impacts to vegetation under Subalternative 1 would be similar to the Proposed Action but greatly reduced due to the limited activities, location of activities, and reduced

frequency and duration. Under Subalternative 1, all three LZ/DZ consist of existing FFS helicopter pads within TA-1, -2, and -8; therefore little to no impacts to vegetation are expected to occur. Wildfire potential would be greatly reduced as there are no blanks/GBS expendables use under Subalternative 1.

### 6.8.2.2 Wildlife

[Table 6-42](#) lists impacts to wildlife in each TA for the Proposed Action and Subalternative 1. Additional information on effects of noise on wildlife is provided in Appendix H, Section H.2.8. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

**Table 6-42. Proposed Action/Subalternative 1 Wildlife Impacts by TA at THSF**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Dismounted movement	<b>Proposed Action:</b> Potential for incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). The probability of impact is low as a result of implementation of General Operational Constraints. <b>Subalternative 1:</b> Impacts would be the same as the Proposed Action but on a lesser scale. The probability of impact is low as a result of implementation of General Operational Constraints.									
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> There is a potential for adverse impact associated with increased wildfire potential from expendables usage. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> Blank/GBS and smoke grenade use would not occur.									
Smoke grenades										
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.									
Aircraft Operations	<b>Proposed Action:</b> Potential adverse impacts associated with disturbance from noise. Aircraft noise would be temporary and intermittent in nature, allowing any dispersed wildlife to return to the area once aircraft have left the area. Noise levels would not be sufficient enough to harm wildlife, though some individuals may startle depending on the proximity of the activity and presence of people or vehicles. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife. <b>Subalternative 1:</b> Impacts would be the same as for the Proposed Action but on a lesser scale with the exception of noise associated with the LZ/DZs. The Air Force would observe avian avoidance buffers to minimize potential startle effects of noise.									
Amphibious Operations	<b>Proposed Action:</b> Increased potential for direct physical impact by boat strike or indirect impact by disturbance or harassment. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints. <b>Subalternative 1:</b> Amphibious Operations would not occur.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

### ***Proposed Action***

The Proposed Action would potentially cause adverse impacts to wildlife, including migratory birds. Because military readiness activities are exempt from the Migratory Bird Treaty Act, except in cases where significant adverse impacts to a population are likely, the Proposed Action is exempt from incidental takes to migratory birds. A consultation with the USFWS associated with migratory birds is not required. Impacts would be related to temporary disturbances associated with harassment from activity and noise, and/or displacement associated with general training activity, minor land disturbances, and wildfire potential. None of these disturbances would be significantly adverse, or long-term in nature. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife. Permanent disturbances associated with consumption of wildlife during survival training would also adversely impact individual species. Survival training is a critical component of military training. It involves foraging and training personnel on critical survival skills (which includes teaching how to prepare traps and snares). It does not involve substantial consumption of natural resources and the likelihood of successful snaring or trapping is traditionally minimal. The Air Force would comply with hunting, trapping and fishing regulations as identified by the FFS. Therefore the likelihood of impacting a sensitive species is very low. Potential adverse impacts to wildlife from consumption would be intermittent and recoverable through natural processes resulting in a negligible long-term impact.

Bears would be left undisturbed, meaning they would be allowed to proceed on their present course. For bears that are feeding or otherwise occupying an area, military units would be the ones to leave. Bears would not be flushed out, chased or driven to populated areas by military activities. The type of disturbances created by military actions include vehicle operations, the presence of people and noise from gunfire, actions not entirely unlike that of other recreational actions. Bear populations at Eglin have not experienced adverse impacts from military activity and the Air Force assumes the same for THSF.

### ***Subalternative 1 (Preferred Alternative)***

With the exception of noise, impacts to wildlife under Subalternative 1 would be similar to the Proposed Action but minimized due to limited activities, location of activities, and reduced frequency and duration. Consumption of wildlife would not occur under Subalternative 1. Wildfire potential would be greatly reduced as there are no blanks/GBS expendables use under Subalternative 1. Noise impacts from aircraft operations would be focused within flyzones surrounding the TH-02, TH-04 and TH-06 LZ/DZ locations, and most noticeable within several hundred feet of the LZ/DZs during aircraft takeoffs and landings. These locations are currently used as FFS helicopter pads. Thus, wildlife near the LZ/DZs may have already been subjected to aircraft noise.

Aircraft flying in and out of the LZ/DZs would potentially affect some wildlife species as a result of noise and visual presence. Response to aircraft noise varies by species, aircraft characteristics, speed of travel, rotary-wing vs. fixed-wing, previous exposure, and whether the animal is in the incubation/nesting phase. Some animal species may be more sensitive than other species and/or may exhibit different forms or intensities of

behavioral responses. Common responses include the “startle” or “fright” response. Intensities and durations of the startle response decrease with the numbers and frequencies of exposures. Mammals appear to react to noise at sound levels higher than 90 dB SEL, and low-level aircraft with a visual presence would potentially elicit a stronger reaction than noise alone. GLI aircraft would transit to and from the LZ/DZs at an altitude of 500 feet AGL. There would be 9 sorties per annual average day with each sortie typically consisting of 1 to 2 aircraft. SELs from proposed GLI aircraft at 500 feet would reach 95 SEL; thus aircraft overflights would likely result in startle responses from birds and wildlife on a daily basis. Flight paths would vary, limiting the likelihood of multiple exposures to a particular area or group of wildlife within a given day. Over time some birds and wildlife may become accustomed to the noise with diminished response. Apiaries are present within all potential flyzones but these would not likely be affected. Each LZ/DZ is different with regard to anticipated use and how wildlife may be affected. [Figure 6-53](#) through [Figure 6-55](#) identify more detailed views of biological resources relative to the proposed LZ/DZ sites under Subalternative 1.

### 6.8.2.3 Protected Species

[Table 6-43](#) lists impacts to protected species in each TA for the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green). Most impacts would be related to temporary disturbances, which would be minimized by avoidance measures.

**Table 6-43. Proposed Action/Subalternative 1 Protected Species Impacts by TA at THSF**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> Known protected species locations would be protected (see <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> ). The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to protected species associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Dismounted Movement	<b>Proposed Action:</b> Known protected species locations would be protected (see <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> ). Potential direct physical impacts resulting in mortality, trampling, or disturbance of transient protected species. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated by distributing educational materials to familiarize personnel with protected species so that troops can avoid transient species where possible. Additionally, established buffer areas around protected species habitats would be utilized. <b>Subalternative 1:</b> Impacts would be the same as the Proposed Action but on a lesser scale associated with the reduced level of proposed activity.									
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> Use of Expendables would avoid known protected species locations (see <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> ). Utilization of blanks and GBSs would be restricted to identified areas, thus minimizing potential noise impacts. Potential adverse impacts associated with increased wildfire potential from utilization of expendables is unavoidable. These impacts are regional in context and long term in duration. Wildfire potential would be mitigated through implementation of safety requirements and adherence to THSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> Blank/GBS and smoke grenade use would not occur.									
Smoke grenades										



**Table 6-43. Proposed Action/Subalternative 1 Protected Species Impacts by TA at THSF, Cont'd**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to wildlife associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Aircraft Operations	<b>Proposed Action:</b> Potential adverse impacts associated with noise disturbance. Impacts would be short term, localized, and mitigated through avoidance of known species locations and associated habitat (see Figure 6-1 through Figure 6-22), resulting in unavoidable, intermittent impacts to transient species. Noise levels would not be sufficient enough to harm protected species, though some individuals may startle depending on the proximity of the activity and presence of people or vehicles. Appendix H, Section H.2.8 provides additional information on effects of noise on wildlife. Comparatively, the potential for noise impacts to protected species is higher for the TH-06 LZ/DZ than for TH-02 or TH-04. Noise impacts would not be considered significant given the context, intensity, duration, and mitigation measures. <b>Subalternative 1:</b> Impacts would be the same as the Proposed Action but on a lesser scale associated with the reduced level of proposed activity.									
Amphibious Operations	<b>Proposed Action:</b> Known protected species locations would be protected (see Figure 6-1 through Figure 6-22). Potential for incidental direct physical impacts (boat strike) or incidental indirect impact of transient protected species could result; however, this potential is minimized given the proposed operational frequency and likelihood that any aquatic species would move from harm's way. <b>Subalternative 1:</b> Amphibious Operations would not occur.									

AFB = Air Force Base; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

### Proposed Action

As discussed in Section 3.8, protected species could be directly impacted by vehicle collisions, land disturbance, noise from aircraft operations and expendables, and potential wildfire from expendable use. Some species may startle depending on the proximity of the activity and presence of people, vehicles or aircraft. Military and civilian aircraft already operate throughout the entire panhandle, though there is no evidence to suggest that protected bird species such as piping plovers, red-cockaded woodpeckers, or other protected bird species are at particular risk at THSF from direct strike or noise. Additional information on noise impacts to wildlife is provided in Appendix H, Section H.2.8. Further, the effector mechanisms of noise and human activity related to military training are not unlike that of recreational hunting, logging, and other human activities that have been conducted at THSF for many years. Thus, some species may have acclimated to noise and other disturbances. The bald eagle, which is not on the endangered list, but is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, nests in several locations in and near THSF. The FWC would periodically provide nest coordinates to the Air Force to avoid all nests, observing a 1,000-foot buffer for aircraft and a 330-foot buffer for ground actions. With the increased troop presence, the potential for human-bear encounters would increase. However, it is unlikely that military training activities would drive bears to migrate outside of their habitat; in case of an encounter with a bear military personnel would leave the area. Vehicles would operate at or under 35 mph on THSF dirt roads, which should reduce the chance for collision with bears, indigo snakes, or other animals that have been struck by vehicles in the past.

AO in TA 10 would move through Gulf sturgeon critical habitat, but the activities would not alter or disturb this species or its habitat. Usage of the water areas for AO and

landings would be similar to current recreational and commercial use, which have no effect on Gulf sturgeon.

Noise-generating expendables (blanks/GBS) would be used throughout THSF with exception of noise constraint areas identified in [Figure 6-12](#) through [Figure 6-22](#).

[Figure 6-1](#) through [Figure 6-11](#) show buffer areas where sensitive species occur. In these buffer areas, training activities would either be restricted or limited at point locations. Section [2.5](#) identifies General Operational Constraints associated with sensitive species.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, impacts to protected species would be similar to the Proposed Action but minimized due to the limited activities, location of activities, and reduced frequency and duration. As stated earlier, wildfire potential would be greatly reduced as there are no blanks/GBS expendables use under Subalternative 1. Noise impacts on protected species from aircraft operations would also be focused within areas surrounding three designated LZ/DZ locations (located in TA-1, -2, and -8). These areas are currently used as FFS helicopter pads, thus aircraft noise at these locations would not be new.

LZ/DZ TH-02 encompasses areas from TAs 2, 3, 5, 6 and 7. There is a bald eagle nest located within the TH-02 flyzone in TA-6, and the Air Force has created an air operations buffer of 1,000 feet around all bald eagle nest so that aircrews will avoid impacting nesting eagles. By observing the buffer, estimated noise received at the nest or tree would be at most 90 SEL from a C-130H or CV-22. Noise at this level would not have health or physiological impacts on birds in general but studies show that communication between individuals could temporarily be affected (Dooling and Popper, 2007). Avian buffers are shown in [Figure 6-53](#) through [Figure 6-55](#). [Table 6-5](#) shows comparative SELs for aircraft commonly operating above THSF.

LZ/DZ TH-04 has a number of avian buffer areas associated with the federally protected red-cockaded woodpecker. The RCW avian buffer area extends 500 feet from the cavity trees, and the C-130H aircraft at that distance would generate noise approaching 95 SEL at the tree. This level of noise would not result in health or physiological impacts but could temporarily interfere with communications between individuals. Birds communicate to establish territories and find mates. In TH-04 there are approximately 13 such avian buffer areas associated with 16 active RCW trees. There is ample space around and between these buffer areas to facilitate avoidance by incoming and outgoing aircraft. The closest buffer area is about one mile from the TH-04 LZ/DZ. Given there are few avian areas to be avoided in TH-04 and large areas with no protected species, disturbance to protected species from aircraft noise and presence would likely be minor.

LZ/DZ TH-06 is characterized by a denser aggregation of avian buffer areas than either TH-02 or TH-04 such that suitable flight paths may be limited compared to TH-02 and TH-04. The TH-06 LZ/DZ encompasses approximately 60 active RCW cavity trees contained within 40 avian buffer areas with the closest active cavity tree about 0.5 miles away from the LZ/DZ. Potential aircraft noise may be concentrated over a smaller area within TH-06, affecting fewer numbers of protected birds and wildlife but more frequently. [Figure 6-53](#) through [Figure 6-55](#) identify more detailed views of biological resources relative to the proposed LZ/DZ sites under Subalternative 1.

Natural resources would not be consumed under Subalternative 1, thereby eliminating any potential impacts from this activity as compared to the Proposed Action. Because no amphibious operations would occur under Subalternative 1, potential to impact protected aquatic species would not occur.

#### 6.8.2.4 Sensitive Habitats

[Table 6-44](#) lists impacts to sensitive habitats within each TA for the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

**Table 6-44. Proposed Action/Subalternative 1 Sensitive Habitat Impacts by TA at THSF**

Effector	Tactical Area (TA)									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> Known sensitive habitats would be protected (see <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> ). The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Dismounted movement	<b>Proposed Action:</b> Known sensitive habitats would be protected (see <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> ). Potential direct physical impacts resulting in indirect disturbance of sensitive habitats. Short-term, localized impacts; while unavoidable, potential for occurrence can be mitigated through established buffer areas around protected species habitats and other sensitive habitats. <b>Subalternative 1:</b> Impacts would be the same as the Proposed Action but on a lesser scale associated with the reduced level of proposed activity.									
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> show avoidance areas for sensitive habitats. Potential adverse impacts associated with increased wildfire potential from utilization of expendables would be unavoidable. These impacts would be regional in context and long term in duration. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices, wildfire potential would be mitigated. <b>Subalternative 1:</b> Blank/GBS and smoke grenade use would not occur.									
Smoke grenades										
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to sensitive habitats associated with these activities (see Section <a href="#">3.8</a> ). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Amphibious Operations	<b>Proposed Action:</b> Potential to adversely affect shoreline vegetation in streams and rivers and marsh vegetation, oyster reefs, and seagrass in estuarine areas. <a href="#">Figure 6-1</a> through <a href="#">Figure 6-22</a> show avoidance areas for sensitive habitats. However, impacts would be minimized to a negligible level through rotation of ingress/egress points and avoidance of oyster reefs, and areas exhibiting shoreline erosion as identified in Section <a href="#">3.7.4</a> . Any impacts would be recoverable over the short-term with implementation of these specific mitigations. <b>Subalternative 1:</b> Amphibious Operations would not occur.									

AFB = Air Force Base; FFS = Florida Forest Service; GBS = ground burst simulator; TA = tactical area; THSF = Tate's Hell State Forest

### ***Proposed Action***

Sensitive habitats with the potential to be impacted by the Proposed Action are shown in [Figure 6-42](#) and discussed in Section [6.8.1.4](#). Impacts to vegetation, discussed in Section [6.8.2.1](#), may be applied to sensitive habitats in THSF; however, all known sensitive habitats would be protected to the extent possible during training activities. Areas slated for ground-disturbing activities would be surveyed for gopher tortoises and burrows would be avoided where possible; burrows that cannot be avoided would be relocated in accordance with FWC guidelines. Additionally, expended items could start wildfires that spread into other areas including those with sensitive habitats. Given that some protected and rare plant species within THSF have been noted to be declining, there is potential for localized long-term impacts. The FFS works to prevent impacts to and manage fire-dependent habitats that support protected species through a program of prescribed burning. Impacts from wildfires would be minimized to the extent possible through a program of prevention, response, and coordination with the FFS. Fire suppression activities, such as the use of heavy machinery for fire response, could result in changes to the landscape, localized alterations to hydrology, sedimentation, and direct damage to vegetation. Parts of the land-water interface of TA-10 border critical habitat for the wintering population of the piping plover. Piping plover are especially susceptible to human disturbance. Troops would avoid potential impacts to piping plover by accessing TA-10 through those areas that do not contain piping plover critical habitat.

### ***Subalternative 1 (Preferred Alternative)***

Impacts to sensitive habitats under Subalternative 1 would be similar to the Proposed Action, however minimized due to the reduction in proposed activities, frequency and duration. Wildfire potential would be greatly reduced as there are no blanks/GBS expendables use under Subalternative 1. All known sensitive habitats would be protected to the extent possible during training activities.

No known sensitive habitats are known to occur in selected areas designated for LZ/DZs though there are sensitive habitats within the flyzone. Some, like bald eagle nests in TH-02 and RCW active cavity trees in all three LZ/DZs, have been discussed in Section [6.8.2.3](#) Protected Species. Frosted flatwood salamander habitat occurs within the flyzone for the TH-06 LZ/DZ and FNAI special natural areas occur within flyzones of TH-02 and TH-04 but changes to these habitats are not expected to occur as a result of noise or visual presence of aircraft using the LZ/DZs.

### **6.8.2.5 Invasive Species**

[Table 6-45](#) lists invasive species impacts in each TA for the Proposed Action and Subalternative 1. Impacts are categorized as follows: adverse (yellow) and neutral/no effect (green).

**Table 6-45. Proposed Action/Subalternative 1 Invasive Species Impacts by TA at THSF**

Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Consumption would not occur.									
Incidental surface disturbance										
Point impact										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). The potential for impact would be minimized by implementation of General Operational Constraints. <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity. Blackout driving would not occur.									
Dismounted movement										
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> Indirectly, burned areas from wildfires started by expendables use could allow establishment and spread of invasives. This increased potential would be unavoidable, and would persist over the long term. However, the potential would be minimized through implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> Blank/GBS and smoke grenade use would not occur.									
Smoke grenades										
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts would be the same as those described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.									
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts associated with invasive species resulting from these activities (see Section 3.8). <b>Subalternative 1:</b> Amphibious Operations would not occur with Subalternative 1.									
Amphibious Operations										

GBS = ground burst simulator; TA = Tactical Area; THSF = Tate's Hell State Forest

### **Proposed Action**

As discussed in Section 3.8, the Proposed Action would potentially cause adverse impacts associated with the spread of invasive species. Implementation of General Operational Constraints identified in Section 2.5 would reduce the potential of spreading invasive species.

### **Subalternative 1 (Preferred Alternative)**

The potential for invasive species to be spread by wildfires under Subalternative 1 is greatly reduced since blanks/GBS expendables would not be used. Use of the LZ/DZs would not result in the spread of or control of invasive species. For other types of training implementation of General Operational Constraints identified in Section 2.5 would reduce the potential for spreading invasive species.

## **6.8.3 Biological Resources Impact Summary**

Table 3-38 describes the context, intensity, and duration factors utilized in analysis for impacts to biological resources; based on these factors the Air Force has identified insignificant impacts to the natural environment. There are unavoidable adverse impacts to biological resources from incidental disturbances associated with dismounted maneuvers and aircraft and AO. Direct unavoidable impacts have also been identified from increased wildfire potential resulting from training activities. The intensity of any of



the identified impacts would be minimized through implementation of General Operational Constraints identified in Section 2.5. The Air Force completed consultation with USFWS in accordance with Section 7 of the ESA on April 8, 2014, and has received concurrence on a finding of “Not Likely to Adversely Affect” sensitive species or habitat (USFWS, 2014). A copy of the Biological Assessment and all associated correspondence is included in Appendix C, *Consultation Documentation*.

[Table 6-46](#) summarizes the impacts identified for the Proposed Action and Subalternative 1. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-46. Proposed Action/Subalternative 1 Biological Resource Impacts Summary – THSF**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
Land Disturbance	Protected species would be protected.		Known sensitive habitats would be protected.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Consumption activities would not occur. Impacts would otherwise generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				
Point impact					
Incidental surface disturbance					
Consumption					
Ground Movement	Known locations of protected species would be protected.		Known sensitive habitats would be protected.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.
Wheeled vehicles	<b>Proposed Action:</b> Potential for incidental direct physical impact (trampling) or incidental indirect impact (disturbance or harassment). However, occurrences are expected to be infrequent, and implementation of required General Operational Constraints would minimize the extent of any adverse impacts. <b>Subalternative 1:</b> Impacts would be generally the same as described for the Proposed Action, with less potential for impact associated with the reduced level of proposed activity.				
Dismounted maneuver					
Use of Expendables	Protected species would be protected.		Known sensitive habitats would be protected.		<b>Proposed Action:</b> Indirectly, burned areas from wildfires started by expendables could allow establishment and spread of invasives. This increased potential would be unavoidable and would persist over the long term. However, the potential would be reduced through implementation of General Operational Constraints
Blanks/GBS	<b>Proposed Action:</b> Potential disturbance from noise would be minimal, since noise-generating expendables would be limited in use. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. Increased potential for wildfire is considered an unavoidable, potentially adverse impact that would persist over the long term. However, given the potential frequency of occurrence based on mission frequency and implementation of General Operational Constraints and adherence to THSF and Eglin AFB wildfire management practices, the potential impact would be minimized. <b>Subalternative 1:</b> There would be				
Smoke grenades					

**Table 6-46. Proposed Action/Subalternative 1 Biological Resource Impacts Summary – THSF, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
	no expendable use at THSF, and therefore no impact.				and adherence to THSF and Eglin AFB wildfire management practices. <b>Subalternative 1:</b> There would be no expendable use at THSF, and therefore no impact.
Other/equipment	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				
Aircraft Operations	<b>Proposed Action:</b> Potential short-term and intermittent noise disturbance to general wildlife species. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term, allowing species to resume normal activities. <b>Subalternative 1:</b> Impacts would be the same as those described under the Proposed Action. Potential short-term and intermittent noise disturbance to general wildlife species would occur in areas surrounding the three potential LZ/DZ sites. While adverse disturbance impacts may occur to general wildlife, impacts would be intermittent and short term allowing species to resume normal activities. Known protected species locations would be protected and not used as LZs/DZs.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.		<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). <b>Subalternative 1:</b> Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.
Amphibious Operations	<b>Proposed Action:</b> Potential for incidental direct physical impact (boat strike) or incidental indirect impact (disturbance or harassment). However, while unavoidable, this potential is expected to be negligible given the proposed operational frequency and likelihood that any aquatic species would		<b>Proposed Action:</b> Activities in estuarine areas could affect marsh vegetation, oyster reefs, or seagrass, as could water-land transition actions. Boat landings and nearshore activities would potentially affect shoreline vegetation in streams and rivers. Given proposed frequency of operation and the implementation of General Operational Constraints the potential for this occurrence is expected to be minimal. <b>Subalternative 1:</b> This activity would not		

**Table 6-46. Proposed Action/Subalternative 1 Biological Resource Impacts Summary – THSF, Cont'd**

Effector	Biological Resource Area Potentially Affected (Receptor)				
	Wildlife	Protected Species	Sensitive Habitats	Vegetation	Invasive Species
	move from harm's way and/or return to the area once operations have ceased. Subalternative 1: This activity would not occur; therefore there would be no impact.		occur; therefore there would be no impact.		
Utilities	Proposed Action: The Air Force has not identified any adverse impacts to biological resources associated with these activities (see Section 3.8). Subalternative 1: Impacts generally the same as the Proposed Action, with less potential for impacts associated with decreased types, frequency and location of potential training activities.				

AFB = Air Force Base; GBS = ground burst simulator; LZ/DZ = landing zone/drop zone; TA = tactical area; THSF = Tate's Hell State Forest

#### 6.8.4 Proposed Resource-Specific Mitigations

No resource-specific mitigations have been identified outside of those requirements associated with the ESA Section 7 consultation for this action, as provided in Appendix C – Consultation Documentation. The consultation requirements have been incorporated into the Operational Constraints because they are required to be implemented as part of the Proposed Action/Subalternative 1.

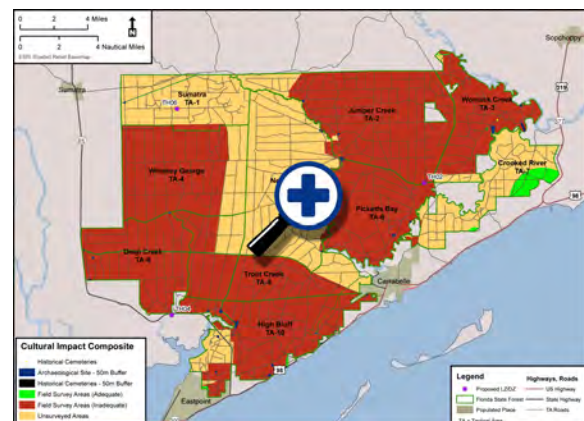
In addition to the general operation constraints identified in Section 2.5, Proposed Resource-Specific Mitigations identified previously associated with earth resources (Section 3.6) and water quality (Section 3.7) are also applicable to the Proposed Action/Subalternative 1.

## 6.9 CULTURAL RESOURCES

### 6.9.1 Affected Environment

#### *Proposed Action/ Subalternative 1 (Preferred Alternative)*

For cultural resources, the ROI for the Proposed Action is identical to that of Subalternative 1 in THSF. Twenty-six cultural resource studies were conducted between 1976 and 2012 in the 10 THSF training areas. Archaeological surveys have been conducted in many of the Training Areas (Figure 6-56). Many of these surveys, are either not up to current scientific standards or were more focused



**Figure 6-56. Cultural Resource Survey in THSF**

academic studies and are not comprehensive in nature (DHR, 2013). Appendix F, *Cultural Resources*, lists surveys conducted on THSF.

Within THSF, there are 35 archaeological sites ranging in age from twentieth century historic contexts to the Early Archaic period (7,500 B.C.). Of these 35 sites, 13 (37.14 percent) are prehistoric, 17 (48.58 percent) are historic, and 3 (8.57 percent) are multicomponent historic and prehistoric. Due to insufficient information, the cultural or temporal affiliation of two sites (5.71 percent) cannot be determined. Most of the 35 sites have not been evaluated by either the principal investigator or the SHPO as to NRHP eligibility (DHR, 2013). Appendix F, *Cultural Resources*, lists sites considered potentially eligible along with those that remain unevaluated.

One historic district, Camp Gordon Johnson (8FR00900), formerly occupied the eastern half of THSF. Starting in 1942, the U.S. Army bought or leased approximately 159,000 acres to establish an amphibious training base for World War II recruits. At its height, Camp Gordon Johnston was Florida's second largest military installation, both in size and troops. The camp spanned over 20 miles along the Gulf Coast between Carabelle and Alligator Point and included St. George and Dog Islands. Originally called Camp Carabelle, the site was officially renamed Camp Gordon Johnston in January 1943. By 1944, the camp was also being used to house German and Italian prisoners of war (Hathaway et al., 2000).

Soon after World War II ended in 1945, the camp was closed. Structural remains and foundations (both above and below ground) were identified in only 3 of 22 surveyed areas. Military-related artifacts, including a dog tag, glass sherds, and a variety of metal fragments, were recorded for a portion of the survey area. Other structural remains included radio tower footers and concrete and brick building foundations. This historic site was identified during background research and further examined during fieldwork (Hathaway et al., 2000). Evaluative testing is recommended to determine NRHP eligibility.

One historic cemetery has been identified in TA-3. The Thompson Cemetery (8FR00873) was a family cemetery established in 1813. It is currently no longer in use but is maintained by the state of Florida (DHR, 2013). To date, no historic structures, TCPs, or SSs have been identified to date within THSF (DHR, 2013).

The proposed LZ/DZ sites at THSF have either not been surveyed for cultural resources, the survey status is unknown or previous efforts are not up to current state survey standards. The following table ([Table 6-47](#)) shows the status of surveys and any known cultural resources within these Proposed Action/Subalternative 1 locations.

**Table 6-47. Cultural Resource Status within THSF LZ/DZ**

Area	Survey Status	Cultural Resources Identified
TH02	Inadequately Surveyed	No Cultural Resources Identified to Date
TH04	Survey Status Unknown	No Cultural Resources Identified to Date
TH06	Unsurveyed	No Cultural Resources Identified to Date

DZ = drop zone; LZ = landing zone; THSF = Tate's Hell State Forest

\*Data from DHR, 2013

## 6.9.2 Environmental Consequences

### *Proposed Action/ Subalternative 1 (Preferred Alternative)*

Impacts are generally the same under both the Proposed Action and Subalternative 1, with less potential for impact under Subalternative 1 associated with the reduced scope of proposed activity. As discussed in Section 3.9, potential adverse impacts to cultural resources may occur from land disturbance activities, dismounted movement, and AO due to ground disturbance. (AO would not occur under Subalternative 1). Other action alternative effectors are not addressed in this section. Impacts to THSF cultural resources identified in Section 6.9.1 would be the same as those described in Section 3.9 and consist of potential disturbance or inadvertent discovery of previously unidentified cultural resources in both surveyed and unsurveyed areas. Ground disturbing activities would be limited in unsurveyed areas, and known cultural resource locations would be avoided as part of general operations constraints (see Section 2.5). The Air Force has notified the ACHP, SHPO, Florida Forest Service and applicable Native American tribes about this Proposed Action. The Air Force and SHPO have completed a Programmatic Agreement, in coordination with the five federally recognized tribes and the Florida Forest Service to meet requirements under Section 106 of the NHPA. The final Programmatic Agreement and results of the consultation process are included in Appendix C of the Final EIS.

## 6.9.3 Cultural Resources Impact Summary

### *Proposed Action/ Subalternative 1 (Preferred Alternative)*

Table 3-41 describes the context, intensity, and duration factors utilized in analysis for impacts to cultural resources. Based on the 36 CFR Section 800.5 definitions of “adverse effect” and “no effect,” the Air Force has determined there is the potential for adverse effects to cultural resources. Implementation of the General Operational Constraints identified in Section 2.5 would minimize the potential for negative effects. In addition, units would have access to a database and maps that would provide spatial and textual information on restrictions associated with specific training areas. These tools would allow units quick access to information on avoidance areas, thus minimizing the potential for impacts to cultural resources.

Table 6-48 summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- No effect (green)

**Table 6-48. Proposed Action/Subalternative 1 Cultural Resource Impacts Summary by TA at THSF**

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential exists to displace or destroy cultural resources in areas not previously surveyed or partially surveyed. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Impacts generally the same as the Proposed									
Point impact										
Incidental surface										



**Table 6-48. Proposed Action/Subalternative 1 Cultural Resource Impacts Summary by TA at THSF, Cont'd**

Proposed Action Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
disturbance	Action, with less potential for impact associated with the reduced level of proposed activities.									
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.									
Dismounted movement	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Same as Proposed Action. However, there would be less frequency of activities overall resulting in less impact.									
Use of Expendables	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.									
Aircraft Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.									
Amphibious Operations	<b>Proposed Action:</b> Known resource areas would be avoided. However, the potential to displace or destroy cultural resources in areas not previously surveyed or partially surveyed exists. While unavoidable, this impact can be mitigated to a negligible level through implementation of General Operational Constraints identified in Section 2.5. <b>Subalternative 1:</b> Amphibious operations would not occur, therefore the Air Force has not identified impacts to cultural resources under this subalternative.									
Utilities	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to cultural resources associated with these activities (see Section 3.9). <b>Subalternative 1:</b> Same as the Proposed Action.									

#### 6.9.4 Proposed Resource-Specific Mitigations

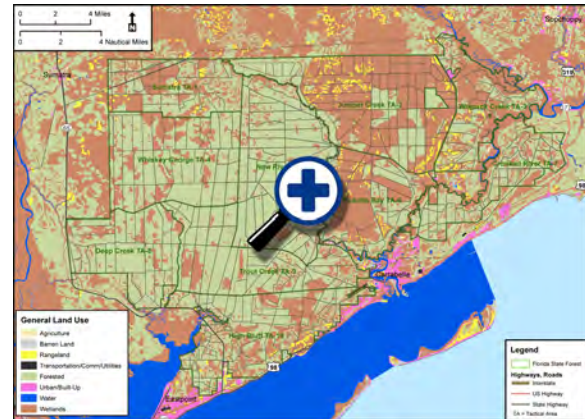
Resource-specific mitigations for cultural resources have been identified and circulated for comment in the *Programmatic Agreement Among Eglin Air Force Base and The Florida Historic Preservation Officer Regarding the Proposed Gulf Regional Airspace Strategic Landscape Initiative*. The Programmatic Agreement identifies specific requirements associated with avoidance and/or minimization of potential impacts to cultural resources that would apply to both the Proposed Action and Subalternative 1. Such requirements (Located in stipulations, Section VI., Resolution of Adverse Effect) include; avoidance and preservation in place of resources, using flagging, signage, and temporary fencing or other such measures around the limits of property. When avoidance is not possible, Eglin AFB will notify the ACHP of an adverse effect finding and inform the ACHP that Eglin AFB will prepare a MOA with SHPO participation. Eglin will also consult the Tribes when developing this MOA if the adversely affected historic properties are TCPs or NRHP eligible prehistoric sites, or eligible historic sites that are significant to the Tribes. More detailed information is provided in the Final signed Programmatic Agreement located in Appendix C, *Consultation Documentation*.

All General Operational Constraints (Section 2.5) identified previously would also serve to minimize any identified adverse impacts (yellow), mitigating them to beneficial or no effect (green).

## 6.10 LAND USE

### 6.10.1 Affected Environment

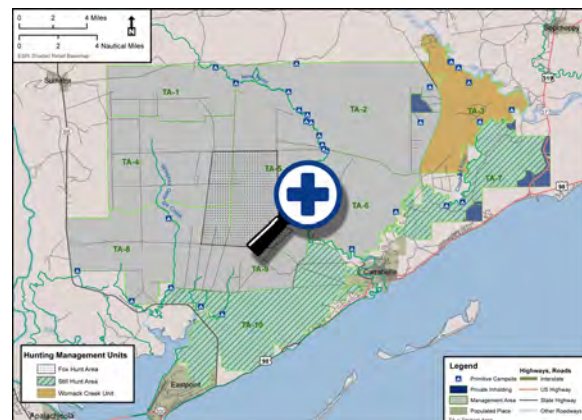
Existing and planned land uses at THSF include rangeland, forested, urban/built up, and wetlands (FDEP, 2007b). [Figure 6-57](#) shows the various land use types, private parcels, and special use areas at THSF. [Table 6-49](#) lists the number, acreage, and percent of land use types present in each TA at THSF (TA-1 through TA-10). More detail regarding land use types and management practices at THSF can be found in the *Ten Year Management Plan for Tate's Hell State Forest*.



**Figure 6-57. Generalized Land Use Types at THSF**

### Recreational Opportunities

The 202,000-acre THSF provides opportunities for recreational activities, including horseback riding (where permitted), camping (where permitted), hunting, fishing, wildlife viewing, biking, picnicking, off-highway vehicle use, and canoeing. Almost the entire THSF area also includes the Tate's Hell WMA including the Womack Creek Unit located in the northeast portion of THSF. Regulation summaries, hunting seasons, and area maps can be found on the FWC website (<http://myfwc.com/hunting/wma-brochures/>).



**Figure 6-58. THSF Recreation and Hunting Areas**

**Table 6-49. General Land Use Types Present in TAs at THSF**

Tactical Area <sup>1</sup> (TA)	Land Use Type						
	Barren Land	Rangeland	Transportation/Communications/Utilities	Forested	Urban/Built Up	Water	Wetlands
<b>TA-1</b>							
# Parcels	0	18	3	62	0	2	386
Acreage		281	70	7,551		11	6,916
% of TA		2	<1	51		<1	47
<b>TA-2</b>							
# Parcels	0	125	0	80	0	3	476
Acreage		176		8,193		69	21,314
% of TA		6		26		<1	68

**Table 6-49. General Land Use Types Present in TAs at THSF, Cont'd**

Tactical Area¹ (TA)	Land Use Type						
	Barren Land	Rangeland	Transportation/ Communciations/ Utilities	Forested	Urban/Built Up	Water	Wetlands
TA-3							
# Parcels	0	31	6	182	5	2	187
Acreage		472	12	5,209	2	67	8,250
% of TA		3	<1	37	<1	<1	59
TA-4							
# Parcels	0	1	0	43	0	0	291
Acreage		8		18,917			5,860
% of TA		<1		76			24
TA-5							
# Parcels	0	1	0	43	0	5	289
Acreage		5		25,758		57	3,366
% of TA		<1		88		<1	12
TA-6							
# Parcels	0	73	0	184	1	1	346
Acreage		673		5,538	<1	35	10,619
% of TA		4		33	<1	<1	63
TA-7							
# Parcels	0	2	2	249	1	5	269
Acreage		12	<1	8,529	<1	24	4,771
% of TA		<1	<1	64	<1	<1	36
TA-8							
# Parcels	0	0	6	58	1	2	172
Acreage			22	13,539	<1	1	2,969
% of TA			<1	82	<1	<1	18
TA-9							
# Parcels	0	2	9	92	4	2	227
Acreage		1	26	16,686	4	4	431
% of TA		<1	<1	79	<1	<1	20
TA-10							
# Parcels	3	31	19	196	17	14	562
Acreage	7	411	82	13,835	7	105	8,453
% of TA	<1	2	<1	60	<1	<1	37

Source: FDEP, 2007b

TA = tactical area; THSF = Tate's Hell State Forest

1. Percentages are approximate and rounded

[Table 6-50](#) lists the recreational areas in each TA and [Figure 6-58](#) shows their locations. The number of recreational users for each recreational area and WMA is not available. However, for 2012-2013 there were approximately 93,000 total visitors to THSF (Miller, 2013).

**Table 6-50. Recreational Areas Present in Each TA at THSF**

Tactical Area (TA)	Major Recreational Areas and Features (associated uses)
TA-1	Primitive camp sites
TA-2	Primitive camp sites Off-highway vehicle access Picnic area Boat launch
TA-3	Primitive camp sites Boat launch area Picnic area
TA-4	None
TA-5	Primitive camp sites
TA-6	Primitive camp sites
TA-7	Primitive camp site Boat launch Picnic area
TA-8	Primitive camp site Picnic area
TA-9	Primitive camp sites
TA-10	Wildlife viewing area Hiking Ralph Kendrick Dwarf Cypress Boardwalk Cash Creek Recreation Area Picnic area Boat launch

Source: FDACS, 2004b

TA = tactical area; THSF = Tate's Hell State Forest

### ***Private and Adjacent Landowners***

Several private inholdings are surrounded by, or adjacent to, the TAs at THSF. Private parcels include private land owners, commercial businesses, and housing for on-site staff. [Figure 6-57](#) shows the locations for the major private parcels at THSF. [Table 6-51](#) lists the number and acreage of private parcels associated with each TA.

**Table 6-51. Private Parcels Present at THSF**

Tactical Area (TA)	Name	Private Inholdings (Within Overall THSF Perimeter)		# Private Holdings Adjacent to THSF/TA Perimeter
		Quantity	Acreage	
1	Sumatra	0		9
2	Juniper Creek	2	116	14
3	Womack Creek	4	620	5
4	Whiskey George	0		6
5	New River			0
6	Picketts Bay			
7	Crooked River	14	5810	22
8	Deep Creek	0		18
9	Trout Creek	3	216	18
10	High Bluff	2	225	123

Source: FDEP, 2007b

TA = tactical area; THSF = Tate's Hell State Forest

## 6.10.2 Environmental Consequences

### *Proposed Action*

Potential adverse impact to land use at THSF may occur from noise resulting from the use of expendables and training activities involving aircraft operations and landing/drop activities. Potential interactions between recreational users, hunters, and military personnel engaged in training activities (e.g., CCDMs, roadway vehicle use, blackout driving) are discussed in Section [3.10](#). Other proposed action effectors are not addressed in this section.

As described previously, the FFS requires that training activities avoid hunting seasons in order to minimize adverse impacts to hunters. The following is an example of when military training activities could occur based on the current 2014-2015 hunting season regulations for the Tate's Hell WMA and the Womack Creek Unit. The regulation summaries, hunting seasons, and area maps for each WMA can be found on the FWC website (<http://myfwc.com/hunting/wma-brochures/>). Fishing is also allowed year-round within the WMAs but should not be adversely impacted by training activities including amphibious operations. Migratory bird hunting is also allowed. Since the specific seasons for migratory bird hunting are set by the USFWS, this would be part of the ongoing coordination between the Air Force and USFWS. Again, the below hunting seasons are for 2014-2015 and provided only as an example; these hunting season constraints would be revised annually in coordination with the FFS, FWC, and USFWS. Avoidance of training during these timeframes would serve to eliminate conflicts between training and hunting activities.

### **Tate's Hell WMA**

Training activities could occur in the designated Still Hunt Area and Fox Hunt Area (unless otherwise noted) during the following times for the 2014-2015 hunting season:

#### ***Day or Night Training***

- March 2–20
- April 27–30
- May 1–31 (except Fox Hunt Area)
- June 1–30 (except Fox Hunt Area)
- July 1–31 (except Fox Hunt Area)
- August 1–31 (except Fox Hunt Area)
- September 1–30 (except Fox Hunt Area)
- October 1–24

#### ***Night Training Only (two hours after sunset and two hours before sunrise)***

- January 1–31 (except Dog Hunt Area)
- February 1–28 (except Dog Hunt Area)
- March 2–31
- May 1–31 (except Fox Hunt Area)



- June 1–30 (except Fox Hunt Area)
- July 1–31 (except Fox Hunt Area)
- August 1–31 (except Fox Hunt Area)
- September 1–30 (except Fox Hunt Area)
- October 25–31
- November 1–7, 8–30 (except Dog Hunt Area)
- December 1–31 (except Dog Hunt Area)

### **Womack Creek Unit**

#### ***Day or Night Training***

- March 2–13, 16–20, 25–31
- April 1, 6–8, 13–30
- May 1–31
- June 1–30
- July 1–31
- August 1–31
- September 1–30
- October 1–25
- November 3–7

#### ***Night Training Only (two hours after sunset and two hours before sunrise)***

- January 1–31
- February 1–28
- March 14–15, 21–24
- April 2–5, 9–12
- October 25–31
- November 7–30
- December 1–31

### ***Subalternative 1 (Preferred Alternative)***

Impacts would generally be the same as described under the Proposed Action. The potential for interaction with recreational users would be diminished associated with the site-specific training proposed, as well as the reduced types, frequency, and duration of activities proposed.

### **6.10.3 Land Use Impact Summary**

[Table 3-45](#) describes the context, intensity, and duration factors utilized in analysis for impacts to land use; based on these factors the Air Force has identified insignificant

adverse impacts to public health and safety and the human and natural environment. Temporary annoyance to recreational users from noise during training activities (see Noise Sections [3.3](#) and [6.3](#)) is unavoidable. Impacts to recreational users and adjacent landowners would be minimized through implementation of operational constraints identified in Section [2.5](#), and avoidance of noise-sensitive areas (see [Figure 6-12](#) through [Figure 6-22](#)).

To minimize potential noise impacts from training activities involving aircraft operations and landing/drop activities, three dedicated LZ/DZ locations that are already established FFS helo-pads would be utilized (see Section [2.3.2.1](#)). While the potential adverse impact on the quality of recreational experiences in these areas may be somewhat diminished, it would not preclude recreational use or cause general incompatibility, and impacts would be intermittent and short term.

Because Subalternative 1 identifies specific locations for training, as well as a reduced number of activities and associated frequency and duration, potential land use impacts (i.e., annoyance from noise to recreational users and landowners) would be greatly minimized. Under Subalternative 1 at THSF there would be no expendable use, no amphibious operations, and training activities involving aircraft operations would only occur at three LZ/DZ locations using designated fly zones at less frequency than for the Proposed Action.

[Table 6-52](#) summarizes the impacts identified. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-52. Proposed Action/Subalternative 1 Land Use Impacts Summary by TA at THSF**

Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with the potential for impact being considerably less due to the reduced level of proposed activity.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> Impacts would generally be the same as under the Proposed Action, with the potential for impact being considerably less due to the reduced level of proposed activity.									
Dismounted movement										
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> Noise generating expendables (i.e., blanks) would be restricted near noise sensitive locations (see <a href="#">Figure 6-12</a> through <a href="#">Figure 6-22</a> ). Measures would be taken to minimize noise impacts, but occasional low level temporary noise impacts to recreational users and adjacent landowners could occur. <b>Subalternative 1:</b> There would be no expendable use at THSF and therefore no impact.									
Smoke grenades										
Other/equipment										
Aircraft Operations	<b>Proposed Action:</b> Although measures such as restrictions regarding the timing and location of aircraft operations (see <a href="#">Figure 6-12</a> through <a href="#">Figure 6-22</a> ) would minimize noise impacts to recreational users and adjacent landowners, occasional low-level temporary noise impacts could occur. <b>Subalternative 1:</b> Training activities involving aircraft operations (e.g., LLHI/E and airdrops) would only occur at three locations using designated fly zones and would not result in any land use conflicts.									
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to land use associated with these activities (see Section <a href="#">3.10</a> ). <b>Subalternative 1:</b> This activity would not occur at THSF; therefore there would be no impact.									

LLHI/E = Low-Level Helicopter Insertions/Extractions; THSF = Tate's Hell State Forest

#### 6.10.4 Proposed Resource-Specific Mitigations

No additional Resource-Specific Mitigations for land use have been identified. All General Operational Constraints (Section 2.5) identified previously, as well as Proposed Resource-Specific Mitigations identified for noise (Section 3.3.4) would sufficiently minimize any identified adverse impacts.

### 6.11 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

#### 6.11.1 Affected Environment

##### *Proposed Action and Subalternative 1 (Preferred Alternative)*

The main concerns regarding socioeconomics and environmental justice include noise, safety, and disturbance associated with the military land and air training that could potentially impact property values, economic activity, recreation and tourism, quality of life and health of the communities, and environmental justice-related populations. Socioeconomic resources associated with THSF are concentrated in Liberty County and Franklin County, Florida, which constitutes the ROI for the analysis.

##### Property Values

Table 6-51 in Section 6.10, Land Use, provides the number and acreage of private parcels associated with each tactical area at THSF. The estimated number of total housing units and the median home value in Franklin and Liberty Counties is shown in Table 6-53 (U.S. Census Bureau, 2013b). Between 2009 and 2013, both counties experienced an annual decline in the median home value and an overall decline of approximately 25 percent in Liberty County and 31 percent in Franklin County during this period.

**Table 6-53. Selected Housing Characteristics in the ROI – THSF**

Location	5-Year Estimates				
	2005–2009	2006–2010	2007–2011	2008–2012	2009–2013
<b>Franklin County</b>					
Total Housing Units	8,397	8,580	8,648	8,639	8,602
Median (dollars)	\$209,500	\$177,000	\$170,100	\$159,800	\$143,900
<b>Liberty County</b>					
Total Housing Units	2,966	3,024	3,177	3,295	3,214
Median (dollars)	\$105,400	\$90,700	\$80,600	\$80,300	\$78,800

Source: U.S. Census Bureau, 2013b

It is generally acknowledged that even during tight economic conditions, a relatively higher premium is placed on properties with access to nature (USEPA, 2012). These premiums placed on properties near natural areas vary according to site-specific characteristics. Several undeveloped acreage properties in Franklin County bordering THSF with access to nature areas, trails, hunting, and other outdoor recreational opportunities range in value between \$4,300 and \$5,400 per acre. These estimates were based on the current asking sale price and the number of acres for various properties listed for sale in the area (Land of America.com, 2014).

### Economic Activity

The local economies of Franklin County and Liberty County are enhanced through revenue producing activities available on the state forest. The major revenue generating activities on THSF are described in the Tate's Hell State Forest Ten Year Management Plan (FDACS, 2007). The activities are broken down into four multiple use categories including timber management, apiary leases, recreation, and miscellaneous forest products. Timber management includes thinning and clear-cutting of slash pine plantations. An apiary is a place where beehives of honey bees are kept and raised for their honey. Recreational activities include camping, hunting, fishing, hiking, canoeing, birding horseback riding, and ecological study. Miscellaneous Forest products include firewood collection, Christmas tree harvest, and worm grunting (FDACS, 2007). The total revenue potential for these income producing activities combined for THSF over the ten year period covered in the Tate's Hell State Forest Ten Year Management Plan (FDACS, 2007) are estimated at \$4,080,000 or \$408,000 annually. The majority of the total revenue would be generated from timber management (98 percent) followed by recreation (1.2 percent), apiary leases (0.5 percent), and miscellaneous forest products (0.25 percent) (FDACS, 2007).

Revenue generating activities help to offset the costs of management and operational costs. Based on the most recent annual budget data available, the budget for THSF totaled \$2,286,914 for FY 2006-2007 (FDACS, 2007).

### Recreation and Tourism

Over the last five years, the largest industry in Franklin County and Liberty County, in terms of employment was the government and government enterprises followed by health care and social assistance (BEA, 2014). The retail trade industry combined with the arts, entertainment, and recreation industry and the accommodation and food services industry could collectively be considered jobs related to the tourism industry. These industries combined suggest that tourism accounts for approximately 22 percent to 24 percent of total employment annually in Franklin County and approximately 7 percent to 9 percent of total employment annually in Liberty County (see [Table 6-54](#)).

**Table 6-54. Employment by Industry, 2008–2012**

Description	Year				
	2008	2009	2010	2011	2012
<b>Franklin County</b>					
Total County Employment	5,760	5,769	5,992	6,224	6,311
Retail Trade	562	562	588	623	596
Arts, entertainment, and recreation	101	118	114	104	108
Accommodation and Food Services	694	632	659	727	762
<b>Total Tourist Industry</b>	<b>1,357</b>	<b>1,312</b>	<b>1,361</b>	<b>1,454</b>	<b>1,466</b>
<b>Liberty County</b>					
Total County Employment	3,482	2,738	2,886	2,996	2,915
Retail Trade	166	145	150	157	141
Arts, entertainment, and recreation	16	16	26	43	45
Accommodation and Food Services	72	56	59	65	78
<b>Total Tourist Industry</b>	<b>254</b>	<b>217</b>	<b>235</b>	<b>265</b>	<b>264</b>

Source: BEA, 2014

The fastest segment of tourism is nature tourism or “ecotourism.” The THSF attracts many recreational users. More information regarding recreational use at THSF is provided in Land Use Sections [3.10](#) and [6.10](#).

While it is evident that recreation provides economic value to the area, the full recreation value of natural resource systems and the characteristics of these resource systems are incomplete because market data does not provide the total value of natural resource systems. Several methods of analysis exist that attempt to estimate the value of natural resource systems and changes in the quality of recreation sites or natural resource systems. One such method is the travel cost method (TCM), a survey-based method which recognizes the value individuals place on a recreation site from the costs they incur to visit the sites. In a study by Pienaar (2014), the author applies the TCM approach to estimate the value of recreation in the Apalachicola River Region which included Tate’s Hell State Forest along with four other areas. The estimated economic value of nature-based recreation in the Apalachicola River Region totaled \$484.56 million in use value with approximately 3.9 million (0.8 percent) attributed to Tate’s Hell State Forest (Pienaar, 2014).

#### Quality of Life and Health

The Behavioral Risk Factor Surveillance Survey (BRFSS), a statewide telephone survey of Florida adults, conducted by the Florida Department of Health provides information on the health of residents in each county and quality of life, defined as the, “perceived physical and mental health that impacts overall health status” (FDH, 2011). [Table 6-55](#) provides several quality of life and health statistics for Franklin and Liberty Counties (FDH, 2010). Both counties had a lower percentage of adults with good to excellent overall health as compared to the state in 2010. Between 2007 and 2010, Franklin County experienced a decline in the percentage of adults with good to excellent overall health but their perceived level of satisfaction with their lives remained fairly stable. Liberty County had a slightly lower percentage than the state. Between 2007 and 2010, Liberty County experienced an increase in the percentage of adults with good physical and mental health but their level of satisfaction with their lives dropped (FDH, 2010).

**Table 6-55. Quality of Life and Health Status, Franklin and Liberty Counties**

Description	Franklin		Liberty		Florida
	2007	2010	2007	2010	2010
Percentage of adults with good to excellent overall health	78.5	73.1	76.0	77.5	82.9
Percentage of adults with good physical health	84.1	83.7	79.5	83.3	87.4
Percentage of adults with good mental health	86.6	87.3	81.6	85.3	88.2
Percentage of adults who are “very satisfied” or “satisfied” with their lives	93.5	93.2	92.7	91.3	93.1
Percentage of adults who always or usually receive the social and emotional support they need	71.9	77.5	77.0	72.3	79.5
Average number of days where poor mental or physical health interfered with activities of daily living in the past 30 days	5.9	6.6	4.8	6.7	5.2
Average number of unhealthy physical days in the past 30 days	4.7	5.2	6.4	5.5	4.1
Average number of unhealthy mental days in the past 30 days	3.8	3.7	5.2	4.5	3.8

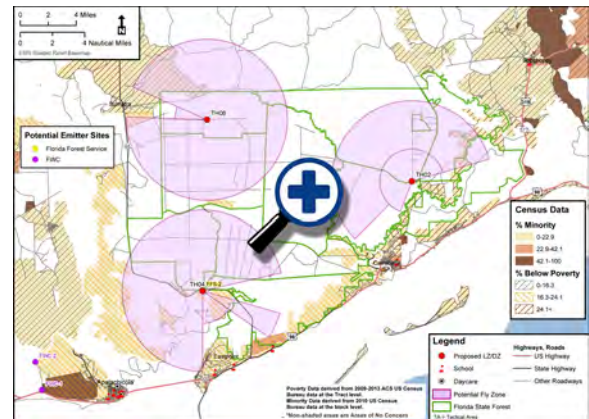
Source: FDH, 2010



## Environmental Justice

[Table 6-56](#) lists the percentage of minority, low-income, and youth populations compared with the COC populations. The AC values represent the percentages of minority and low-income populations within a geographic extent representing the ROI. Locations where the countywide percentages, or AC percentages, are greater than the statewide percentages, or COC percentages, are identified as having potential EJ concerns. As indicated in [Table 6-56](#) and [Figure 6-59](#), the individual counties and the two-county ROI have a lower percent of minority and youth populations than the state and the nation but a higher percent of low-income populations than the state and the nation.

There are no schools, childcare centers, or hospitals located on THSF; however, there are campgrounds, privately owned parcels with at least one residential structure, hiking and horseback riding trails and stables located throughout the forest that could be considered noise-sensitive locations. Schools and childcare centers are also shown in [Figure 6-59](#).



**Figure 6-59. Environmental Justice Areas of Concern Near THSF**

**Table 6-56. Total Populations and Populations of Concern**

Region	Total Population	Minority (%)	Low-Income <sup>1</sup> (%)	Youth (%)
Franklin County	11,549	20.4%	20.6%	17.1%
Liberty County	8,365	26.4%	24.1%	21.2%
Two-County ROI	19,914	22.9%	22.1%	18.8%
Florida	18,801,310	42.1%	16.3%	21.3%
United States	308,745,538	36.3%	15.4%	24.0%

Source: U.S. Census Bureau 2010, 2013a

ROI = region of influence

\*1. American Community Survey, 5 year estimate, 2009–2013

## 6.11.2 Environmental Consequences

### Proposed Action

As discussed in Section [3.11](#), potential adverse impacts to socioeconomic resources may occur from safety issues associated with wildfire and land use incompatibility associated with noise resulting from UoEX and aircraft operations. Other proposed action effectors are not addressed in this section. Impacts to THSF socioeconomic and environmental justice resources identified in Section [6.11.1](#) would be the same as those described in Section [3.11](#).

### Property Values

As discussed in Section [3.11](#), it is difficult to quantify the potential impact to property values due to the many variables involved. Private parcels are interspersed throughout the ROI. Based on the five-year estimates of the median housing value between 2009 and 2013, as shown in [Table 6-53](#), it would be anticipated that the trend in housing values would continue in which there would be an annual decline in the median home value for properties in Franklin County or Liberty County. However, there are many characteristics that influence the price of a home including location, size, year built, amenities, interest rates, and local economic conditions.

Many studies have reported a positive effect on sales prices of homes located near natural areas including parks and forest lands due to amenities such as convenient access to recreation and wildlife, less crowds, less noise, and less pollution. In addition, many studies have concluded that noise has a negative impact on property values. Certain UoEX and air operations have the potential to generate noise and wildfire risk which could impact property values adjacent to and nearby forest boundaries, although the extent of the impact would vary based on the characteristics identified previously. As a result, while there may be some effect to property values over time it would be difficult to correlate those changes to the Proposed Action. Implementation of General Operating Constraints outlined in Section [2.5](#) would restrict noise-intensive activities around NSAs such as residential parcels to minimize the potential impact to property values and the Air Force does not anticipate any significant impact to property values as a result of the Proposed Action.

With regards to wildfire, there is minimal risk as described in Section [3.4](#). The potential impact to property values would depend on the scope of the fire itself; a large wildfire that impacts private property would obviously have a direct effect on the property, with the extent of the effect directly correlating to the value of the property pre-fire. If a wildfire were to impact private property due to the activities associated with the Proposed Action, it would be anticipated that the housing market would be impacted immediately following the event but would eventually diminish over time. While the risk of wildfire is greater with the use of expendables during training, implementation of wildfire prevention requirements as identified in Section [3.4](#) would minimize potential wildfire occurrences at THSF. Given this, the Air Force does not anticipate significant adverse impacts from wildfire based on the low potential for wildfires to a) occur, and b) directly impact private property.

### Economic Activity

The THSF provides opportunities for multiple uses by different users. The various activities the forest supports provide revenue to the FFS and help offset the costs associated with managing the forests. Under the Proposed Action, the FFS would benefit from additional revenue generated from the permit/lease fee. The permit/lease fee has yet to be negotiated between the Air Force and the FFS. Potential economic benefits associated with the increased revenue to FFS from the Air Force lease would likely be minor, and any localized spending of military during training activities is considered incidental and would not be significant. Implementation of General Operational Constraints identified in Section [2.5](#) would allow continued multiple uses

with minimal impact to other revenue producing activities available on the state forest. Additional details on potential impacts to recreation and tourism under the Proposed Action are discussed in more detail below.

### Recreation and Tourism

Certain ground and air maneuver training activities have been identified as resulting in potentially adverse recreation and tourism impacts due to the noise associated with these activities because users could perceive noise as an adverse impact on the quality of the environment or outdoor experience. These impacts have been identified as adverse but not significant due to the assessment that these impacts are typically recoverable over the short-to-medium term when mitigations, required to minimize the level of impact or potential for impact, are implemented. However, in the event that a visitor does have an undesirable experience due to the Proposed Action, there would be potential for that visitor to not return to the area. If negative experiences associated with the Proposed Action become frequent and shared by an increasing number of visitors, the FFS, and potentially local businesses, could experience a loss of revenue and an associated potential reduction in employment related to the tourism industry from a decrease in the number of first time and repeat visitors. Implementation of General Operational Constraints identified in Section [2.5](#) would be anticipated to minimize the potential for significant impacts to local businesses by minimizing the potential for adverse experiences for recreational users.

### Quality of Life and Health

The term, “quality of life” refers to the degree of well-being felt by an individual or group and typically includes physical (i.e. health, diet, protection against pain and disease) and psychological (i.e. stress, worry, and emotional states) aspects (FWCC, 2014). Since these aspects are highly subjective to the individual, it is difficult to measure directly. The BRSFF attempts to measure the quality of life for communities in the Florida counties by surveying individuals and gleaning their perceptions on their personal physical and mental health. The BRSFF results suggest that the majority of adults in Franklin County and Liberty County are “very satisfied” or “satisfied” with their lives. The BRSFF correlates health to quality of life but does not explicitly consider the role that the quality of the environment has on these metrics. For instance, it does not include the potential forest-derived human health benefits such as an improvement in air quality and a decrease in urban noise. It is assumed, however, that a higher environmental quality positively influences mental and physical health and perceived quality of life since it offers a greater incentive for people to participate in outdoor recreation. Outdoor participants are more likely to perceive themselves as healthier than those that do not participate in outdoor recreation (Outdoor Foundation, 2012).

Certain ground training activities and air operations would be anticipated to result in adverse impacts to recreational users from additional noise. While the noise impacts associated with the Proposed Action are considered adverse due to the potential perception by an individual that the actions would result in a decrease in the quality of the recreational experience or a decrease in physical and emotional health, the training activities would not preclude recreational use or cause general incompatibility, and impacts would be short term. General Operational Constraints outlined in Section [2.5](#)

would be implemented to minimize access restrictions and minimize impacts on the quality of the natural environment which in turn would be anticipated to minimize impacts on the mental and physical health and perceived quality of life of recreational users. Therefore the Air Force does not anticipate significant adverse impacts to quality of life and health from use of the forest for training activities

### **Environmental Justice and Special Risks to Children**

Environmental justice impacts and special risks to children may result from noise, safety, and land use impacts as described in Sections [3.3](#) (Noise), [3.4](#) (Safety), and [3.10](#) (Land Use). General Operational Constraints outlined in Section [2.5](#) would be implemented to avoid noise-sensitive areas, defined as campgrounds, privately owned parcels with at least one residential structure, hiking, horseback riding trails and stables. Under these conditions, no disproportionate impacts to minority and low-income populations or special risks to children would be anticipated.

### ***Subalternative 1 (Preferred Alternative)***

Under Subalternative 1, the potential impacts to socioeconomic resources associated with noise and disturbance from ground activity and aircraft would be similar to those as described under the Proposed Action. However, the potential for impacts, and the extent of those impacts, would be substantially less than the Proposed Action. Expendable use would not occur and there would only be three active LZs/DZs located in relatively remote locations that are already currently being used by the FFS; aircraft activities would occur on a less frequent basis. Consequently, while there is potential for adverse impacts, under Subalternative 1 would have a substantially lesser impact on socioeconomic resources than under the Proposed Action since there would be less frequent noise and potential interaction of military training with recreational users and private residents.

Similarly to the Proposed Action, no impacts have been identified under Subalternative 1 that would disproportionately impact environmental justice populations or pose special risks to children.

### **6.11.3 Socioeconomics/Environmental Justice Impact Summary**

Socioeconomic and environmental justice impacts are tied to those related to noise (Sections [3.3](#) and [6.3](#)), safety (Sections [3.4](#) and [6.4](#)) and land use (Sections [3.10](#) and [6.10](#)). [Table 3-48](#) describes the context, intensity, and duration factors utilized in analysis for impacts to socioeconomic and environmental justice; based on these factors the Air Force has identified insignificant socioeconomic or environmental justice impacts to public health and safety and the human environment.

[Table 6-57](#) provides a summary of the impacts identified under the Proposed Action. Impacts are categorized as follows:

- Adverse (yellow)
- Neutral/no effect (green)

**Table 6-57. Proposed Action/Subalternative 1 Socioeconomic/Environmental Justice Impacts Summary – THSF**

Effector	Tactical Area									
	1	2	3	4	5	6	7	8	9	10
Land Disturbance										
Land development	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to socioeconomics or disproportionate impacts to environmental justice areas with these activities (see Section <a href="#">3.11</a> ). <b>Subalternative 1:</b> Same as Proposed Action.									
Point impact										
Incidental surface disturbance										
Consumption										
Ground Movement										
Wheeled vehicles	<b>Proposed Action:</b> Minimal-to-no noise and safety issue have been identified that would affect transient users or residences resulting in socioeconomic resource impacts and minority, low-income, or youth populations. Ground movements would avoid established recreational sites and private property. The Air Force has not identified any adverse impacts to socioeconomic resources or disproportionate impacts to environmental justice areas of concern associated with these activities. <b>Subalternative 1:</b> Same as Proposed Action.									
Dismounted movement										
Use of Expendables										
Blanks/GBS	<b>Proposed Action:</b> Potential adverse impacts to socioeconomics resources associated with increased wildfire potential and noise. Impacts would be mitigated through implementation of General Operational Constraints identified in Section <a href="#">2.5</a> , as well as Proposed Resource-Specific Mitigations described in Sections <a href="#">3.3/6.3</a> (Noise) and Sections <a href="#">3.4/6.4</a> (Safety). Such mitigations include avoidance of noise-sensitive areas and adherence to wildfire management requirements. <b>Subalternative 1:</b> There would be no UoEX at THSF under this alternative. Therefore, no impacts to socioeconomic resources or disproportionate impacts to minority, low-income, or youth populations.									
Smoke grenades										
Other/equipment										
Aircraft Operations	<b>Proposed Action:</b> Potential adverse impacts to socioeconomics resources associated with noise from aircraft operations (see Sections <a href="#">3.3/6.3</a> [Noise]). Impacts would be mitigated through operational constraints described in Section <a href="#">2.5</a> and Proposed Resource-Specific Mitigations described in Section <a href="#">6.3</a> [Noise]), such as use of avoidance areas and other flight constraints. <b>Subalternative 1:</b> Noise impacts from aircraft operations would be similar to those under the Proposed Action, although on a much lesser, more site-specific scale. Proposed LZs/DZs are existing LZs used by the FFS and are outside the buffers established to minimize adverse noise impacts to private property owners and established recreational sites. Additionally, aircraft operations would be significant less than those under the Proposed Action. While annoyance to some residences and transient recreationalists due to overflights cannot be avoided, the Air Force does expect these impact potentials to result in significant adverse socioeconomic impacts.									
Amphibious Operations	<b>Proposed Action:</b> The Air Force has not identified any adverse impacts to socioeconomics or environmental justice with these activities (see Section <a href="#">3.11</a> ). <b>Subalternative 1:</b> There would be no amphibious operations at THSF under this alternative. Therefore, no impacts to socioeconomic resources or disproportionate impacts to minority, low-income, or youth populations.									

DZ = drop zone; FFS = Florida Forest Service; GBS = ground burst simulator; LZ = landing zone; THSF = Tate's Hell State Forest; UoEX = Use of Expendables

#### 6.11.4 Proposed Resource-Specific Mitigations

Proposed Resource-Specific mitigations would include all of the General Operational Constraints (Section [2.5](#)) identified previously, as well as Proposed Resource-Specific Mitigations identified for noise (Section [3.3.4](#)) and safety (Section [3.4.3](#)). No additional Resource-Specific Mitigations for socioeconomics and environmental justice have been identified as a result of analyses in this chapter.



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## 6.12 SOLID AND HAZARDOUS MATERIALS/WASTE

### 6.12.1 Affected Environment

#### *Proposed Action / Subalternative 1 (Preferred Alternative)*

No hazardous materials or hazardous or petroleum wastes would be generated at most THSF sites, because no industrial activities would occur at these sites. At administrative locations, personnel would perform limited maintenance of vehicles and equipment, primarily consisting of oil and fluid changes. Consequently, hazardous materials stored at these sites include small quantities (55-gallon containers or smaller) of lubricating oil, hydraulic fluid, antifreeze, solvents, and paints. Wastes generated would include waste and solvents. All materials and wastes would be managed according to established FFS requirements. These requirements include the use of secondary containment and the availability of spill response equipment.

Additionally, the affected environment would comprise FFS requirements regarding the use and management of hazardous materials and wastes.

### 6.12.2 Environmental Consequences

#### *Proposed Action*

As discussed in Section [3.12.3](#), no adverse impacts to public health and safety and the human and natural environment associated with solid and hazardous material or waste would occur from training activities and this resource area is not discussed in detail in this section.

All activities would comply with applicable federal, state, and local regulations. During training, all appropriate steps would be taken to minimize potential impacts from debris/residue. For example, all solid waste generated would be collected and disposed. All metallic debris (e.g., brass cases) from training operations would be collected and recycled and, therefore, not disposed of as solid waste. The following would also be prohibited as part of training: throwing smokes, flares, or simulators directly into a water body; abandoning, dumping, burying, or otherwise concealing munitions, pyrotechnics, or residue, including packing materials, and releasing chemicals or metals (including brass) into streams, wetlands, or water bodies. The *Eglin AFB Interstitial Area Final Programmatic Environmental Assessment* (U.S. Air Force, 1998c) analyzed the environmental impact of increasing yearly ground troop movement in interstitial spaces from 55,800 troops per year (1997) to 167,500, equal to a 200 percent increase. No adverse environmental impacts associated with chemical releases or solid/hazardous waste were determined from the 200 percent increase in ground troops regarding debris and the use of blanks, smokes, and flares during ground troop training activities in Eglin AFB training areas. The *Eglin AFB Interstitial Area Final Range Environmental Assessment, Revision 1* (U.S. Air Force, 2009), documented chemical releases from the munitions of the same quantity and types as are associated with the current Proposed Action and found no significant adverse impacts. Consequently, no significant adverse impacts are anticipated with the release of chemicals under the Proposed Action.

***Subalternative 1 (Preferred Alternative)***

No expendables would be employed during training at THSF, thus there would be no impacts associated with expendable chemical releases.

**6.13 INFRASTRUCTURE AND TRANSPORTATION****6.13.1 Affected Environment**

Based on the limited interaction between training activities and utilities and transportation resources, discussion of the affected environment for infrastructure at THSF is general in nature. The affected environment for both the Proposed Action and Subalternative 1 is essentially the same.

***Utilities***

Utilities within THSF are extremely limited. Utilities are present at the THSF Headquarters; the Womack Creek Group Recreation Area has a bathhouse. Also, NFWFMD operates four deep water table monitoring wells: two in the Juniper Creek Tract (TA-2) and two in the Womack Creek Tract (TA-3) (THSF, 2007).

***Transportation***

The local and regional road network between Eglin AFB/Hurlburt Field and THSF is well developed. Public access to THSF is via paved roads, including County Road 67, SR 65, and US 98. THSF can also be accessed from the north through the Apalachicola National Forest. THSF has over 850 miles of nonpaved roads, of which 268 miles are classified as primary and secondary roads. All of the recreation areas can be accessed via these primary and secondary roads (THSF, 2007).

**6.13.2 Environmental Consequences**

As discussed in Section [3.13.2](#), no adverse impacts to public health and safety and the human and natural environment associated with use of utilities or transportation resources would occur from training activities under the Proposed Action or Subalternative 1. All activities would comply with federal, state, and local regulations. As a result, this resource area is not discussed further in this chapter.

**6.14 TATE'S HELL STATE FOREST IMPACT SUMMARY**

[Table 6-58](#) provides a summary of impact determinations associated with training activities, for potentially affected resources based on analyses presented in Chapter [3](#), Sections [3.2](#) through [3.13](#), and Chapter 6, Sections [6.2](#) through [6.13](#). A "dot" in a cell indicates an interaction between the training activity and the respective resource. Impacts are categorized as follows:

- Adverse (yellow) – Potential impact to public health and safety, the human and natural environment, and/or potential violation of federal, state, or local regulations
- Neutral/no effect (green)

No significant impacts have been identified under the Proposed Action or Subalternative 1. Adverse, insignificant impacts have been identified for the Proposed Action and Subalternative 1 and are described in detail in the respective resource area chapters. Overall, while impact types are generally the same between the Proposed Action and Subalternative 1, in all cases the potential impact level would be much less under Subalternative 1 given the reduced scope of activity, including limited aircraft operations, no expendable use, no amphibious operations, and elimination of other activities as shown in [Table 6-53](#).

The analyses in these sections were conducted based on effectors associated with training activities (as identified in [Table 3-1](#) and their impacts on receptors identified in [Table 3-2](#). The impact summary provided in [Table 6-58](#) ties these two tables together and identifies the degree of impact to affected resources associated with specific training activities as described in Section [2.3.2](#). This allows the reader to understand the potential impacts associated with specific training activities.

Proposed Resource-Specific Mitigations applicable to both BRSF and THSF resulting from general analysis were previously identified in Section [3.14.1](#). Additional Proposed Resource-Specific Mitigations specific to THSF identified through analysis in this chapter are provided in Section [6.14.1](#) that would serve to further minimize or avoid any identified adverse impacts.

**Table 6-58. THSF Proposed Action/Subalternative 1 Impacts Summary**

Training Activity Component	Resource Area Potentially Affected											
	Airspace (3.2/6.2)	Noise (3.3/6.3)	Safety (3.4/6.4)	Air Quality (3.5/6.5)	Earth Resources (3.6/6.6)	Water Resources (3.7/6.7)	Biological Resources (3.8/6.8)	Cultural Resources (3.9/6.9)	Land Use (3.10/6.10)	Socioeconomics/ Environmental Justice (3.11/6.11)	Haz/Solid Materials & Waste (3.12/6.12)	Infrastructure (3.13/6.13)
LZs/DZs												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1		•	•	•	•	•	•	•	•	•	•	•
Use of Expendables												
Proposed Action		•	•	•	•	•	•	•	•	•	•	
Subalternative 1	This activity would not occur at THSF.											
LLH/E												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Temporary Combat Support Areas												

**Table 6-58. THSF Proposed Action/Subalternative 1 Impacts Summary, Cont'd**

Training Activity Component	Resource Area Potentially Affected											
	Airspace (3.2/6.2)	Noise (3.3/6.3)	Safety (3.4/6.4)	Air Quality (3.5/6.5)	Earth Resources (3.6/6.6)	Water Resources (3.7/6.7)	Biological Resources (3.8/6.8)	Cultural Resources (3.9/6.9)	Land Use (3.10/6.10)	Socioeconomics/ Environmental Justice (3.11/6.11)	Haz/Solid Materials & Waste (3.12/6.12)	Infrastructure (3.13/6.13)
Proposed Action					•	•	•	•			•	
Subalternative 1					•	•	•	•			•	
Airdrops												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Air/Land Vertical Lift												
Proposed Action	•	•	•	•	•		•	•	•	•	•	
Subalternative 1	•	•	•	•	•		•	•	•	•	•	
Cross Country Dismounted Movements												
Proposed Action					•	•	•	•	•	•	•	
Subalternative 1					•	•	•	•	•	•	•	
Roadway Vehicle Use												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1		•	•	•	•	•	•	•	•	•	•	•
Blackout Driving												
Proposed Action		•	•	•	•	•	•	•	•	•	•	•
Subalternative 1	This activity would not occur.											
Emplacement of Obstacles												
Proposed Action					•		•	•	•		•	
Subalternative 1	This activity would not occur.											
Bivouacking/ Assembly Areas												
Proposed Action				•	•		•	•	•		•	
Subalternative 1	This activity would no occur.											
Communications and Surveillance Operations												
Proposed Action				•	•		•	•	•		•	
Subalternative 1				•	•		•	•	•		•	
Amphibious Operations												
Proposed Action		•	•	•	•	•	•	•	•	•	•	
Subalternative 1	This activity would not occur.											
Natural Resource Consumption												
Proposed Action					•	•	•				•	
Subalternative 1	This activity would not occur.											

**Table 6-58. THSF Impacts Summary, Cont'd**

Training Activity Component	Resource Area Potentially Affected											
	Airspace (3.2/6.2)	Noise (3.3/6.3)	Safety (3.4/6.4)	Air Quality (3.5/6.5)	Earth Resources (3.6/6.6)	Water Resources (3.7/6.7)	Biological Resources (3.8/6.8)	Cultural Resources (3.9/6.9)	Land Use (3.10/6.10)	Socioeconomics/Environmental Justice (3.11/6.11)	Haz/Solid Materials & Waste (3.12/6.12)	Infrastructure (3.13/6.13)
<b>Overwater Hoist Operations</b>												
Proposed Action	•	•	•	•	•	•	•	•	•	•	•	•
Subalternative 1	•	•	•	•	•	•	•	•	•	•	•	•
<b>Opposing Forces Vehicle Operations</b>												
Proposed Action	•	•	•	•	•	•	•	•	•	•	•	•
Subalternative 1	•	•	•	•	•	•	•	•	•	•	•	•
<b>Hardened Camp Site Use</b>	This activity is not applicable to THSF.											

DZ = drop zone; LZ = landing zone; LLHI/E = Low-Level Helicopter Insertions/Extractions

#### 6.14.1 THSF Proposed Resource-Specific Mitigations

Based on the scope of activities associated with the Proposed Action, the inherent General Operational Constraints identified in Section 2.5, and related impact analyses detailed in this EIS, the following Proposed Resource-Specific Mitigations have been identified to further minimize or avoid adverse impacts—in most cases impacts would be minimized such that impact levels would be reduced from “adverse” (yellow) to “neutral” or “no effect” (green).

##### Noise

Noise generating expendables would not be used within 4,000 feet of noise-sensitive locations. Figure 6-12 through Figure 6-22 show the areas in which training activities would be restricted based on buffer distances described above and in Section 3.3.4. Buffers are established from all privately-owned parcels containing at least one residential structure and all campgrounds.



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## 7. CUMULATIVE IMPACTS

According to CEQ regulations, cumulative effects analysis in an EIS should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7).

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### 7.1 CUMULATIVE IMPACT ANALYSES PRINCIPLES

Cumulative effects may occur when there is a relationship between a proposed action or alternative and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. The effects may then be incremental (increasing) in nature and result in cumulative impacts. Actions overlapping with or in proximity to the proposed action or alternatives can reasonably be expected to have more potential for cumulative effects on “shared resources” than actions that may be geographically separated. Similarly, actions that coincide temporally will tend to offer a higher potential for cumulative effects.

In this EIS, the Air Force has made an effort to identify actions on or near the action areas associated with the Proposed Action that are under consideration and in the planning stage at this time. These actions are included in the cumulative analysis sections to the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action and associated resources. Although the level of detail available for those future actions varies, this approach provides the decision maker with the most current information to evaluate the consequences of the alternatives. The EIS addresses cumulative impacts in order to assess the incremental contribution of the alternatives to impacts on affected resources from all factors.

Given the global and cumulative nature of climate change associated with GHGs, cumulative impacts associated with GHGs are addressed below. Revised Draft CEQ guidance on climate change and NEPA require analysis of “[t]he relationship of climate change effects to a proposed action or alternatives, including the relationship to proposal design, environmental impacts, mitigation and adaptation measures.”

GHGs are gases that trap heat in the atmosphere. The accumulation of GHGs in the atmosphere regulates the earth’s temperature. GHG emissions are generated by both natural processes and human activities. GHGs include water vapor, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, ozone, and several hydrocarbons and chlorofluorocarbons (CFCs). Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the Earth’s surface. The GWP of a particular gas provides a relative basis for calculating its CO<sub>2</sub>e, or the amount of CO<sub>2</sub> that would be equal to CO<sub>2</sub>, which has a GWP of 1 and is, therefore, the standard by which all other GHGs are measured. The U.S. Global Change Research Program report *Global Climate Change Impacts in the United States* states the following:

Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with important contributions from the clearing of forests, agricultural practices, and other activities. Warming over this century is projected to be considerably greater than over the last century. The global average temperature since 1900 has risen by about 1.5 degrees Fahrenheit (°F). By 2100, it is projected to rise another 2 degrees to 11.5 °F. The U.S. average temperature has risen by a comparable amount and is very likely to rise more than the global average over this century, with some variation from place to place.

Several factors will determine future temperature increases. Increases at the lower end of this range are more likely if global heat-trapping gas emissions are cut substantially. If emissions continue to rise at or near current rates, temperature increases are more likely to be near the upper end of the range. Volcanic eruptions or other natural variations could temporarily counteract some of the human-induced warming, slowing the rise in global temperature, but these effects would only last a few years. Reducing emissions of CO<sub>2</sub> would lessen warming over this century and beyond. Sizable early cuts in emissions would significantly reduce the pace and the overall amount of climate change. Earlier cuts in emissions would have a greater effect in reducing climate change than comparable reductions made later. In addition, reducing emissions of some shorter-lived heat-trapping gases, such as CH<sub>4</sub>, and some types of particles, such as soot, would begin to reduce warming within weeks to decades. Climate-related changes have already been observed globally and in the United States. These include increases in air and water temperatures, reduced frost days, increased frequency and intensity of heavy downpours, a rise in sea level, and reduced snow cover, glaciers, permafrost, and sea ice. A longer ice-free period on lakes and rivers, lengthening of the growing season, and increased water vapor in the atmosphere have also been observed. Over the past 30 years, temperatures have risen faster in winter than in any other season, with average winter temperatures in the midwest and northern Great Plains increasing more than 7°F. Some of the changes have been faster than previous assessments had suggested.

These climate-related changes are expected to continue while new ones develop. Likely future changes for the United States and surrounding coastal waters include more intense hurricanes with related increases in wind, rain, and storm surges (but not necessarily an increase in the number of these storms that make landfall), as well as drier conditions in the southwest and Caribbean. These changes will affect human health, water supply, agriculture, coastal areas, and many other aspects of society and the natural environment (Karl et al., 2009). While regional and state impacts are more difficult to predict than large regional or global impacts, a report by the Florida Governor's Action Team on Energy and Climate Change (2012) says that regional models indicate the following possible impacts in the state of Florida:

- Sea level rise could lead to flooding of low-lying areas, erosion of beaches, loss of coastal wetlands, intrusion of saltwater into water supplies, and increased vulnerability of coastal areas to storms and hurricanes.

- As climate changes, this could cause some plants and animals to go extinct, some to decline or increase in population, and others migrate to areas with more favorable conditions. For example, along the coast, fish that need colder temperatures to survive could migrate north, while more tropical varieties could move up the coast into Florida.
- Diseases and pests with current tropical ranges could invade Florida, as have West Nile virus and Africanized honey bees in Florida's panhandle.
- Crops and trees that need cooler climates may not grow as well in Florida, while more tropical varieties might do better.
- More severe storms and droughts could affect crop production, pests, and growth rates.

While the Proposed Action would result in GHG emissions, based on the analysis presented in Chapters 3, 4, 5, and 6, the Air Force has identified only minor GHG emission increases over the baseline condition. Emissions would be associated with extra travel time/distance resulting from transport to and from each state forest as opposed to remaining on Eglin AFB. In all other respects, GHG emissions would be similar to the baseline condition from a regional and global context. Therefore, the Air Force expects the Proposed Action to have negligible cumulative impacts to GHG production and climate change when taken into context with other factors affecting climate change.

At this time, analysis of whether global warming or climate change will have an effect on the Proposed Action is purely speculative due to the uncertainties and vagaries of the available science and timelines for potential climate change impacts. Were the impacts associated with climate change to occur as outlined previously there would certainly be an effect on the Proposed Action [e.g., potential climate impacts (such as increased adverse weather) and sea-level rise (increasing wetland areas) in THSF affecting ability to conduct training], as well as impacts to human-related activities as a whole. Any proposal design, mitigation and/or adaptation measures to minimize the effects of climate change on the Proposed Action would be developed as climate change effects are more fully realized, and would likely be part of an overall strategy by the Air Force to adapt to climate change impacts.

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## 7.2 CUMULATIVE IMPACT ASSESSMENT METHODOLOGY

No unmitigatable adverse impacts have been identified for use of emitters sites, thus the Air Force has not identified any correlating potential for cumulative impacts from emitter site use.

Cumulative analysis therefore focuses on the potential for cumulative impacts associated with the Proposed Action and each state forest region, as well as northwest Florida as a whole. Analysis is conducted by first identifying past, present, and reasonably foreseeable actions as related to the ROI for the particular resource. Cumulative impacts are then identified if the combination of proposed activities and past, present, and reasonably foreseeable actions interact with the resource to the

degree that incremental or additive effects occur. In the absence of any adverse impacts identified for solid/hazardous waste and infrastructure/transportation, no cumulative impacts have been identified and these issue areas are not discussed further.

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## **7.3 BLACKWATER RIVER STATE FOREST CUMULATIVE IMPACT ASSESSMENT**

### **7.3.1 BRSF Regional Past/Present/Reasonably Foreseeable Future Actions**

Actions potentially interacting with resources impacted by the Proposed Action are limited to activities associated with BRSF, since the affected resources related to the Proposed Action are those within BRSF and along its borders. The main action for consideration under cumulative impacts for BRSF is FFS implementation of the BRSF Forest Management Plan; this plan details specific forest management goals, objectives, and projects that would be implemented over the specified planning period.

Multi-use strategies to utilize and conserve state forest resources include:

- Support state forest management objectives and sustain efficient sources of revenue through the implementation of sustainable forest management practices.
- Provide resource-based outdoor recreational opportunities for multiple interests.
- Restore and manage healthy forests and native ecosystems and ensure the viability of listed plants and animals.
- Protect archaeological, historical, cultural, and paleontological resources.
- Restore, maintain, and protect hydrologic functions of water resources and health of aquatic communities.
- Cooperate with the military to facilitate mission-essential training in a manner that does not adversely impact natural resources, forest management, or public access (FDACS, 2013).

Overall, the FFS implementation of the management plan would serve to conserve and enhance the natural environment of BRSF, and improve recreational opportunities at BRSF; this would not be expected to result in adverse impacts to BRSF resources.

Additionally, the Proposed Action would be required to comply with applicable FFS forest management plan requirements, thus ensuring no management conflicts between the Proposed Action and the FFS management program.

The FFS is actively involved with ongoing and proposed projects to control erosion and sedimentation in surface waters and wetlands at BRSF. These projects include efforts to restore highly eroded areas (with various state and federal agencies), monitoring groundwater quality and quantity (with NFWFMD), and ongoing road and trail evaluations. Ongoing and future projects include closing unneeded roads, surfacing other roads, installing rock at low-water stream crossings, restricting vehicle access to the more sensitive primitive recreation sites, restricting access to some primitive

recreation sites that are closed permanently or seasonally, and reengineering and revegetating problem areas to abate erosion at road-stream crossings and borrow pits.

To assess potential regional cumulative impacts, the comprehensive plans for Okaloosa (Okaloosa County, 2009) and Santa Rosa (Santa Rosa County, 2008) Counties were reviewed. The road departments for each county provide ongoing operational maintenance for BRSF roads within their jurisdiction. It is anticipated that impacts from commercial logging activities outside the forest, but within the affected county areas, would be similar to those for BRSF. Both counties maintain active boat launching facilities along major streams.

The other action with potential cumulative impacts at BRSF is the beddown of the F-35 at Eglin AFB currently being evaluated in another NEPA document (U.S. Air Force, 2013b).

### 7.3.2 Cumulative Impacts by Resource Area

#### Airspace

The beddown of 59 F-35s at Eglin AFB currently under way will increase the number of sorties flown in the Eglin MOAs and R-2915 (U.S. Air Force, 2008). At BRSF, a majority of GLI training operations would be conducted at altitudes below the floor altitudes of the Eglin MOAs. Proposed GLI training would have minimal cumulative effects in combination with increased F-35 flight activity since they occur in different airspace.

Airspace in the region is currently somewhat congested, and demand for airspace is expected to increase. The Strategic Plan developed as part of the GRASI includes several recommended strategies that would improve ATC procedures, enhance military capacity, and enhance collaboration among airspace users in the region. These strategies include, but are not limited, to reorganization of the Pensacola North MOA and increased coordination between airspace managing agencies. If these strategies are adopted, they would reduce the potential effects that continued growth in demand for available airspace would have on regional traffic flow and the efficiency of operations. Proposed GLI training would not typically require use of SUA or extensive ATC management. GLI training would allow nonhazardous training currently conducted in R-2915 to be conducted elsewhere, partially alleviating scheduling concerns in a critical airspace unit. Cumulative impacts at a regional level would be minimal and include beneficial impacts.

#### Noise

Operational scenarios including F-35 utilization of training airspace continue to evolve. However, as of May 2013, it was anticipated that noise levels beneath R-2915A and Eglin A MOA would not exceed 62 dB DNL<sub>mr</sub> once F-35 units are at full strength. F-35 aircraft are not expected to use Eglin B MOA frequently, and noise levels beneath the MOA would remain below 45 dB DNL<sub>mr</sub> (U.S. Air Force, 2013). F-35 individual overflight noise levels are substantially higher than noise levels generated by aircraft during GLI training (see [Table 5-5](#)). In most portions of BRSF beneath Eglin A MOA and R-2915A, noise generated by GLI training would not add appreciably to overall time-averaged noise levels generated by the F-35 and other aircraft. Additional



annoyance could result from experiencing F-35 training noise as well as proposed GLI training noise, particularly in the immediate vicinity of designated GLI training locations.

### **Safety**

From a regional perspective, training activities that currently occur on adjacent Eglin AFB would occasionally occur at BRSF and would not necessarily result in an incremental impact to safety within the region. While there would not be an overall increase in the number of potential aircraft mishaps (because the overall number of aircraft operations would not change), BRSF-related areas could see an increase in location-specific occurrences during training activities, due to the shift of operations to the area, while there would be less probability of mishaps at Eglin AFB. Similarly, with wildfires the overall potential for wildfires would shift from Eglin AFB to BRSF during training activities, but the overall number of wildfires occurring in the BRSF region is not likely to increase or decrease in any substantive manner. The probability of occurrence based on drought conditions, wildfire fuel load, and the number of potential fire-starting activities would generally remain the same. Implementation of wildfire prevention requirements as identified in Section [3.4](#) would minimize potential wildfire occurrences. While there are potential safety concerns inherent to training activities, these would be mitigated through implementation of SOPs and other constraints identified in Section [3.4](#), thus minimizing the potential for cumulative impacts within the BRSF region.

### **Air Quality**

Any training activities would be consistent with the restoration and maintenance plans for the state forests. Each plan outlines the resource protection measures designed to reduce impacts for future use. Because the Air Force, the FFS, and other agencies are already conducting activities in the ROI, the increase in emissions due to training activities would be a small percentage of the overall emissions in the region and mainly associated with the extra travel distance from Eglin AFB to BRSF. As a result, negligible cumulative impacts to air quality are expected.

### **Earth Resources**

Analysis focuses on activities where there is a discernible potential for the Proposed Action to affect the nature of earth resource impacts and effects at the regional (Okaloosa and Santa Rosa Counties) scale.

Contributing mounted troop movements and other training related vehicle-based support activities could increase the utilization of some roads and crossings maintained by Okaloosa and Santa Rosa Counties. It is anticipated that potential incremental soil erosion and sedimentation cumulative effects of military vehicles would not diminish the life cycle of county road and crossing improvements and would be insignificant. Proposed Action training constraints and mitigations to avoid and amend mission-related roadscape damage would benefit affected sites.

Contributing aircraft LZ/DZ landings and dismounted troop movements could damage post-harvest clearcut earth resources but would not impact county commercial logging operations and incrementally increase stream sedimentation rates. Constraints and mitigations to avoid and amend mission-related damage would benefit affected sites

and minimize soil erosion and sedimentation. It is anticipated that potential earth resource impacts would be insignificant. Mission activities would not occur at county-maintained boat launches or other recreational sites outside BRSF. As applicable, the military would coordinate directly with the FFS to ensure consideration of county planning objectives related to transportation and conservation.

### Water Resources

The cumulative impacts on water resources should take into account all surface-altering actions that have occurred or are likely to occur within or adjacent to the ROI. The most frequent effect of surface disturbance in this region is accelerated erosion and sediment deposition which may affect water resources by contributing sediment, introducing contaminants, or increased flooding. The primary cumulative impacts on surface water and wetlands would result from any increase in the acreage of earthmoving activities and accelerated erosion from roads and trails that have the potential to increase sediment delivery and surface water runoff downstream or introduction of chemical contaminants into surface waterbodies and wetlands.

All proposed training activities at BRSF would be consistent with the forest management plans and policies for the forest and hydrologic restoration plans for BRSF. Proposed Air Force training activities would comply with all federal, state, or local regulations. In addition, Air Force environmental management regulations and policy contained in EAFBI 13-212, *Range Planning and Operations*, and the *Interstitial Area Range Final Environmental Assessment Revision 2* (U.S. Air Force, 2013c) identify specific measures to prevent potential adverse effects to water resources from proposed training activities. These measures include, but are not limited to, restricting vehicle access to existing roads, trails, and approved stream/wetland crossings; establishing protective buffers around streams and wetlands; use of BMPs to prevent soil erosion and sedimentation in streams and wetlands; and use of spill prevention measures to prevent contamination in surface waters, aquifers, or wetlands from fuel spills.

Impacts to water resources from the proposed training activities would be minimized as long as troops adhere to all environmental management requirements and proposed mitigative measures. Therefore, the Air Force does not expect any of the proposed training activities to incrementally contribute to other impacts to water resources at BRSF.

### Biological Resources

As discussed in Section [5.8.2](#), there would be some adverse but not significant impacts on biological resources under the Proposed Action. However, no additional cumulative impacts have been identified that would adversely impact biological resources. BRSF is a multi-use state forest that utilizes and conserves state forest resources that will best serve the people of the state of Florida while maintaining the purpose for which BRSF was acquired. Additional potential for wildfires and ongoing recreational activities would have adverse cumulative impacts on the forest. However, cumulative contributions would be insignificant due to forest management practices. The FFS goal is to restore and manage healthy forests and native ecosystems to ensure the long-term viability of biological resources, including all wildlife and protected species and habitat communities. Additionally, the FFS would continually cooperate with the U.S. military to

facilitate mission-essential training in a manner that does not adversely impact natural resources, forest management, or public access. The *Ten-Year Resource Management Plan for BRSF* (FDACS, 2013), in coordination with Santa Rosa and Okaloosa County Comprehensive Plans, only contribute beneficial cumulative impacts on biological resources.

### Cultural Resources

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or demolition of historic structures or the disturbance or removal of cultural artifacts may incrementally impact the cultural and historic setting of BRSF.

Recreational activities and forestry management practices at BRSF have long occurred in the training areas under consideration for the Proposed Action. The inclusion of additional training activities such as those that currently occur on Eglin AFB, if unrestrained, could cumulatively impact various resources. These activities, which involve cross-country ground movement and other potentially ground-disturbing activities, are guided by previously mentioned operating instructions, such as EAFBI 13-212, as well as numerous other agreed-upon stipulations resulting from other actions. These operating instructions, as discussed in Section [3.9.4](#), would be implemented at BRSF as well. Thus, given the required coordination with BRSF staff and 96 CEG/CEIEA Cultural Resources Office, required mitigations as set forth in the Programmatic Agreement (located in Appendix C) and BMPs, as well as any measures recommended by the SHPO, mission activities are not expected to contribute to cumulative impacts to archaeological resources.

### Land Use

When combined with past, present, or reasonably foreseeable actions, no cumulative impacts to land use receptors are anticipated, since the impacts at BRSF would not carry any significant long-term adverse impacts. While other actions in the region, such as the proposed F-35 beddown may impact land use, the Proposed Action would not result in any incompatibilities with existing land use guidance or documents (see [Table 3-44](#)). In addition, impacts to recreational users and landowners would be minimized or eliminated by following impact avoidance measures as discussed in the land use baseline and impacts section as well as those described in the mitigation sections of this EIS (Sections [3.10](#), [4.10](#), [5.10](#), and [6.10](#)).

### Socioeconomics/Environmental Justice

As identified in Chapter 5, both the Proposed Action and Subalternative 1 would result in potential adverse impacts to socioeconomic resources from noise and risk of wildfire associated with ground training and air operations. Additional annoyance could result from experiencing F-35 training noise as well as proposed GLI training noise, particularly in the immediate vicinity of designated GLI training locations. Training activities would avoid use of established recreational sites, campgrounds, privately owned parcels with at least one residential structure, hiking and horseback riding trails and stables located throughout the forest. Activity buffers have been established around adjacent residences and recreational sites in order to minimize the noise

impacts which might influence property values, recreation and tourism, and an individual's perceived quality of life and health. Similarly, implementation of wildfire prevention requirements would minimize potential wildfire occurrences in the BRSF. The potential for cumulative impacts under Subalternative 1 would be substantially less due to the reduced level and location of activities as compared to the Proposed Action (expendable use only at hardened camp sites, limited cross country dismounted movement and LZ/DZ use, no amphibious operations, etc.).

No disproportionately adverse impacts to minority or low-income populations have been identified for the Proposed Action or Subalternative 1, and none would be expected from a cumulative perspective when considering other actions.

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## **7.4 TATE'S HELL STATE FOREST CUMULATIVE IMPACT ASSESSMENT**

### **7.4.1 THSF Regional Past/Present/Reasonably Foreseeable Future Actions**

Similar to BRSF, actions potentially interacting with resources impacted by the Proposed Action are limited to activities associated with THSF, since the affected resources related to the Proposed Action are those within THSF and along its borders. The main action for consideration under cumulative impacts for THSF is FFS implementation of the THSF Forest Management Plan; this plan details specific forest management goals, objectives, and projects that would be implemented over the specified planning period.

THSF multi-use forest resource management objectives are to:

- Restore, maintain, and protect all native ecosystems.
- Ensure the long-term viability of populations and species considered endangered, threatened, or of special concern.
- Integrate human use through a total resource concept, not emphasizing any particular use over the others or over restoration, maintenance, and protection of native ecosystems.
- Protect known archaeological and historical resources.

Practice sustainable forest management utilizing sound silvicultural techniques (FDACS, 2007).

Overall, the FFS implementation of the management plan would serve to conserve and enhance the natural environment of THSF, and improve recreational opportunities at THSF; this would not be expected to result in adverse impacts to THSF resources. Additionally, the Proposed Action would be required to comply with applicable FFS forest management plan requirements, thus ensuring no management conflicts between the Proposed Action and the FFS management program.

The FFS is actively involved with ongoing and proposed projects to control erosion and sedimentation in surface waters and wetlands. These projects include efforts to restore highly eroded areas, monitoring recreational areas and uses to identify impacts on water resources, and use of BMPs to protect water resources on the forest (FDACS,

2007). The main future plans include road and trail evaluations to identify and rehabilitate problem areas contributing to erosion and sedimentation in surface waters and wetlands and working with NFWFMD to implement the hydrologic restoration plan for streams and wetlands at THSF (NFWFMD, 2010a; NFWFMD, 2010b).

No county comprehensive or management plans were identified for Liberty or Franklin County. However, it is expected that commercial logging activities outside the forest, but within the affected county areas, would be similar to those for THSF. The road departments for each county also provide ongoing operational maintenance of paved and unpaved roads in the vicinity of THSF.

The beddown of an operational squadron of F-22 aircraft and detachment of T-38 aircraft at Tyndall AFB will increase the demand on airspace in the region.

#### **7.4.2 Cumulative Impacts by Resource Area**

##### **Airspace Management**

The beddown of an operational squadron of F-22 aircraft and detachment of T-38 aircraft at Tyndall AFB will increase the number of sorties flown in the Tyndall MOAs (U.S. Air Force, 2011b). Existing internal DoD coordination and scheduling processes would be sufficient to de-conflict multiple DoD users of the training airspace. Cumulative impacts on airspace management would be minimal.

Airspace in the region is currently somewhat congested, and demand for airspace is expected to increase. The Strategic Plan developed as part of the GRASI includes several recommended strategies that would improve ATC procedures, enhance military capacity, and enhance collaboration among airspace users in the region. If these strategies are adopted, they would to reduce the potential effects of continued growth in demand for available airspace on regional traffic flow and efficiency of operations. Proposed GLI training would not typically require use of SUA or extensive ATC management. GLI training would allow nonhazardous training currently conducted in R-2915 to be conducted elsewhere, partially alleviating scheduling concerns in a critical airspace unit. Cumulative impacts at a regional level would be minimal and include beneficial impacts.

##### **Noise**

Individual overflight noise levels generated by F-22 and T-38 aircraft are higher than noise levels generated by GLI training aircraft while operating at the same altitudes. However, F-22 and T-38 aircraft would typically operate at much higher altitudes than those used during GLI training. As described in the *Environmental Analysis for F-22 Operational Squadron and T-38 Detachment at Tyndall AFB*, both F-22 and T-38 aircraft would spend 95 percent of training time at altitudes above 10,000 feet MSL. The time-averaged noise level beneath Tyndall F MOA would remain below 45 dB DNL<sub>mr</sub>, and the noise level beneath Tyndall G MOA would increase by 1 dB or less after beddown of these aircraft is complete (U.S. Air Force, 2011b). Additional annoyance could result from F-22 training noise, as well as noise from proposed GLI training, particularly in the immediate vicinity of designated training locations.



## Safety

Airspace over the THSF region is regularly used by military aircraft and subject to aircraft mishaps. The THSF region could see an increase in mishaps during training activities due to the shift of operations to the area, while there would be less probability of mishaps at Eglin AFB. However, the probability of an aircraft mishap is low and has not been identified as a significant safety issue. Similarly, the overall potential for wildfires would shift from Eglin AFB to the THSF region during training activities, but the overall number of wildfires occurring within the region is not likely to increase or decrease in any substantive manner. The probability of wildfires based on drought conditions, wildfire fuel load, and the number of potential fire-starting activities would remain the same. Implementation of wildfire prevention requirements as identified in Section 3.4 would minimize potential wildfire occurrences. While there are potential safety concerns inherent to training activities, these would be mitigated through implementation of SOPs and other constraints identified in Section 3.4, thus minimizing the potential for cumulative impacts within the THSF region.

## Air Quality

Any training activities would be consistent with the restoration and maintenance plans for the state forests. Each plan outlines the resource protection measures designed to reduce impacts for future use. Combined emissions from other aircraft operations in the area would be minimal given that most aircraft, with the exception of those identified as part of the Proposed Action, operate at altitudes that do not adversely affect air quality.

Analysis has shown that training activities would have a negligible impact to air quality; therefore, negligible cumulative impacts to air quality are expected.

## Earth Resources

Contributing vehicular use of public roads under the Proposed Action to access THSF could increase the utilization of some county-maintained roads. However, the potential incremental cumulative effects from soil erosion and sedimentation caused by military vehicles would not diminish the life cycle of county road and crossing improvements and would be insignificant.

## Water Resources

The most frequent effect of surface disturbance in this region is accelerated erosion and sediment deposition, which could affect water resources by contributing sediment, introducing contaminants, or increasing flooding. The primary cumulative impacts on surface water and wetlands would result from any increase in the acreage of earth-moving activities and accelerated erosion from roads and trails, which could increase sediment delivery and surface water runoff downstream or introduce chemical contaminants into surface water bodies and wetlands.

All proposed training activities at THSF would be consistent with the forest management plans and policies for the forest and hydrologic restoration plans for THSF. Proposed Air Force training activities would comply with all federal, state, or local regulations. In addition, Air Force environmental management regulations and policy contained in EAFBI 13-212, *Range Planning and Operations*, and the *Interstitial Area Range Final*

*Environmental Assessment Revision 2* (U.S. Air Force, 2013c) identify specific measures to prevent potential adverse effects to water resources from proposed training activities. These measures include, but are not limited to, restricting vehicle access to existing roads, trails, and approved stream/wetland crossings; establishing protective buffers around streams and wetlands; use of BMPs to prevent soil erosion and sedimentation in streams and wetlands; and use of spill prevention measures to prevent contamination in surface waters, aquifers, or wetlands from fuel spills.

Impacts to water resources as a result of the proposed training activities would be minimized as long as troops adhere to all environmental management requirements and proposed mitigative measures. Therefore, the Air Force does not expect any of the proposed training activities to incrementally contribute to other impacts to water resources at THSF.

### **Biological Resources**

There is a potential for cumulative impacts resulting from the Proposed Action in combination with recreation, silviculture, NFWFMD hydrologic recovery efforts, and FFS ecological management of THSF natural resources. Short- to medium-term adverse cumulative impacts are initially anticipated, with long-term beneficial impacts once effectiveness of NFWFMD and FFS restoration programs is realized. The FFS would continually cooperate with the U.S. military to facilitate mission-essential training in a manner that does not adversely impact natural resources, forest management, or public access at THSF.

### **Cultural Resources**

Damage to the nature, integrity, and spatial context of cultural resources can have a cumulative impact if the initial act is compounded by other similar losses or impacts. The alteration or demolition of historic structures or the disturbance or removal of cultural artifacts may incrementally impact the cultural and historic setting of THSF.

Recreational activities and forestry management practices at THSF have long occurred in the training areas under consideration for the Proposed Action. The inclusion of additional training activities at THSF such as those that currently occur on Eglin AFB, if unrestrained, could cumulatively impact various resources. These activities, which involve cross-country ground movement and other potentially ground-disturbing activities, are guided by previously mentioned operating instructions, such as EAFBI 13-212, as well as numerous other agreed-upon stipulations resulting from other actions. These operating instructions, as discussed in Section [3.9.4](#), would be implemented at THSF as well. Thus, given the required coordination with THSF staff and 96 CEG/CEIEA Cultural Resources Office, required mitigation and BMPs, as well as any measures recommended by the SHPO, mission activities are not expected to contribute to cumulative impacts to archaeological resources.

### **Land Use**

When combined with past, present, or reasonably foreseeable actions, no cumulative impacts to land use receptors is anticipated, since the impacts at THSF would not carry any significant long-term adverse impacts. Land use impacts are not anticipated to

have cumulative impacts at THSF. The Proposed Action would not result in incompatibilities with existing activities, land use regulations, or planning documents (see [Table 3-44](#)). As discussed in Sections [3.10](#), [4.10](#), [5.10](#), and [6.10](#), the timing and location of training activities and emitter site operations, as well as the mitigation measures presented in these sections, would prevent or minimize any potential impacts to land use receptors. No regional cumulative impacts are anticipated to land use receptors considering other activities occurring in the northwest Florida region.

### **Socioeconomics/Environmental Justice**

As identified in Chapter [6](#), the Proposed Action and Subalternative 1 would result in potential adverse impacts to socioeconomic resources from noise and risk of wildfire associated with ground training and air operations. Additional annoyance could result from experiencing F-35 training noise as well as proposed GLI training noise, particularly in the immediate vicinity of designated GLI training locations. Training activities would avoid use of established recreational sites, campgrounds, privately owned parcels with at least one residential structure, hiking and horseback riding trails and stables located throughout the forest. Activity buffers have been established around adjacent residences and recreational sites in order to minimize the noise impacts which might influence property values, recreation and tourism, and an individual's perceived quality of life and health. Similarly, implementation of wildfire prevention requirements would minimize potential wildfire occurrences in the THSF. The potential for cumulative impacts under Subalternative 1 would be substantially less due to the reduced level and location of activities as compared to the Proposed Action (no expendable use, limited LZ/DZ use, no amphibious operations, etc.).

No disproportionately adverse impacts to minority or low-income populations have been identified for the Proposed Action and Subalternative 1, and none would be expected from a cumulative perspective when considering other actions.

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## 8. NO ACTION ALTERNATIVE IMPACT ANALYSIS

Implementation of the No Action Alternative means that none of the Proposed Action components as described in Sections [2.3.1](#) and [2.3.2](#) would occur at the respective locations (emitter sites, BRSF, and THSF). All activities would remain on Eglin AFB and no new emitter sites would be established.

There would be no impacts to the proposed emitter sites, BRSF, or THSF beyond those resulting from normal activities at these locations, such as recreational use and typical forest management activities conducted by the FFS as identified in the respective state forest management plans. Evaluation of the impacts of these activities on the affected environment is beyond the scope of this EIS.

Impacts to the Eglin Range and associated airspace would be as described in the *Eglin AFB Final Interstitial Range Environmental Assessment Revision 2* (U.S. Air Force, 2013c), the *Eglin AFB Riverine/Estuarine Final Programmatic Environmental Assessment* (U.S. Air Force, 2004), and the *Eglin AFB Final Overland Air Operations Programmatic Environmental Assessment* (U.S. Air Force, 2006).

Implementation of the No Action Alternative would not meet the purpose and need for the Proposed Action, and would result in continued scheduling issues between nonhazardous ground training operations and hazardous testing and training operations.



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## 9. OTHER NEPA CONSIDERATIONS

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### 9.1 RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

#### *Short-Term Uses*

The Proposed Action would have minor short-term effects related to use of resources during land improvements in support of LZs, consumptive use, traveling, use of produced materials, fuels, etc. The permit/lease fee has yet to be negotiated between the Air Force and the Florida Forest Service (FFS). Potential economic benefits associated with the increased revenue to FFS from the Air Force lease would likely be minor, and any localized spending of military during training activities is considered incidental and would not be significant.

#### *Long-Term Productivity*

Based on analysis of the Proposed Action provided in Chapters 3 through 7, the Air Force has not identified any long-term adverse impacts to productivity as a result of unmitigated short-term impacts. The scope of activities associated with the Proposed Action would result in minor long-term productivity benefits as the GLI would be a program wherein training activities occur intermittently over time; thus, short-term increases in direct and indirect demand for goods and services while training activities occur would be intermittent over the long term as the GLI program is established and implemented. Long-term benefits to the FFS associated with lease fees would be realized through leasing agreements; however, this is not an easily quantifiable impact since it is unknown how this income would be distributed within the state government. If these funds were directed back to the specific state forest, then there would be a direct benefit to each forest.

#### *Short-Term Uses Versus Long-Term Productivity*

The assessment of effects on long-term productivity is related to whether the project is consistent with long-term regional and local planning objectives. Under the Proposed Action, there would be minor increases in employment, income, and net fiscal benefits and revenues to the FFS and surrounding communities during training activities. Training activities at the state forests would be scheduled to avoid conflict with hunters and other recreational users, thus avoiding impacts to long-term productivity associated with recreational use of the forests. Local short-term impacts to resources would be consistent with the regional, state, and local long-term planning objectives.

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### 9.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis identify any irreversible and irretrievable commitments of resources involved in the implementation of the Proposed Action or alternatives. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a

reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Implementing the Proposed Action would require a commitment of natural, physical, human, and fiscal resources. In all of these categories, irreversible and irretrievable commitments of resources would occur in the form of utilization of energy resources such as fossil fuels (for transportation, associated with utility use, etc.). However, these physical resources should generally be in sufficient supply that their commitment would not have an adverse effect on the resources' local, regional, or national continued or future availability. Land disturbance as described in the Proposed Action would not result in irretrievable resource commitments, as any land disturbance would be minor in nature and would be recoverable over the short-to-medium term.

While none of the proposed activities involve direct habitat alteration, some biological resources would be directly lost as a result of consumptive use during training activities; however, no sensitive species would be impacted, and the amount of general wildlife species taken would be insignificant when compared to the amount of hunting taking place at each proposed location. Incidental contact (such as a vehicle strike) may also result in incidental mortality to some species; while this cannot be completely avoided, the potential can be minimized by implementation of the General Operational Constraints and Proposed Resource-Specific Mitigations identified in this EIS.

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### **9.3 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES AND MITIGATION MEASURES**

Energy requirements associated with the Proposed Action are limited to use of fossil fuels in support of transportation and utility use. Conservation potential for this resource is limited to general energy conservation techniques, such as making sure no lights remain on at hardened camp sites, transportation pooling, etc.

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### **9.4 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL**

While use of natural resources as a component of the training environment would occur at each forest (e.g., consumption training), use of natural resources for the Proposed Action is expected to be "non-intrusive," in the sense that the goal of the Air Force in implementing the Proposed Action is to avoid to the greatest extent possible adverse impacts to natural and anthropogenic resources and to be compatible with FFS forest management plans. To this end, the Air Force has developed General Operational Constraints and Proposed Resource-Specific Mitigations to avoid or minimize impacts on the environment. Consequently, the Air Force will support conservation measures of the FFS through implementation of these requirements. Other than use of fossil fuels as discussed previously, there are no requirements for depletable resources associated with the Proposed Action.

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## 13. GLOSSARY

*Accretion* is the gradual increase or extension of land by natural forces acting over a long period of time, as on a beach by the washing up of sand from the sea floor or a floodplain by the accumulation of sediment deposited by a stream.

*Airspace – Class C, D, E* refers to controlled airspace designations as defined by the Federal Aviation Administration in order JO 7400.2J, Part 4 Chapter 14, Section 1 ([http://www.faa.gov/air\\_traffic/publications/atpubs/AIR/air1401.html](http://www.faa.gov/air_traffic/publications/atpubs/AIR/air1401.html)).

*Alluvial* pertains to the materials or processes associated with stream sediment transportation and deposition whereas *fluvial* pertains to waterways produced by stream or river action.

*Deltaic* refers to land formation processes associated with alluvium, nearly flat and fan-shaped, depositions at or near the mouth of a river or stream where it enters a body of relatively quiet water such as a lake or sea.

*Karst* is a kind of topography formed in limestone, gypsum, or other soluble rocks by dissolution.

*Land-surface form* is the description of a given terrain area based on empirical analysis of the land surface rather than interpretation of genetic factors. Surface form may be expressed quantitatively in terms of vertical and planimetric slope-class distribution, local and absolute relief, and patterns of terrain features such as drainage lines or terraces.

*RNAV*, or Area Navigation, can be defined as a method of navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigation signals or within the limits of a self-contained system capability, or a combination of these.

*Solution pipe* refers to a subsurface, vertical, cylindrical or cone-shaped hole, formed by dissolution in soluble limestone bedrock. These features often are without surface expression filled with soil materials and serve as a bypass rout for internal water flow.

*Stratigraphy* is the branch of geology that deals with the definition and interpretation of layered earth materials; the conditions of their formation; their character, arrangement, sequence, age, and distribution; and their correlation by the use of fossils and other means.

*Tolerable erosion rate* refers to an erosion rate that is lower than the rate of soil development. Soils are assigned a tolerance value primarily based on the thickness of the soil above bedrock or unaltered parent material.

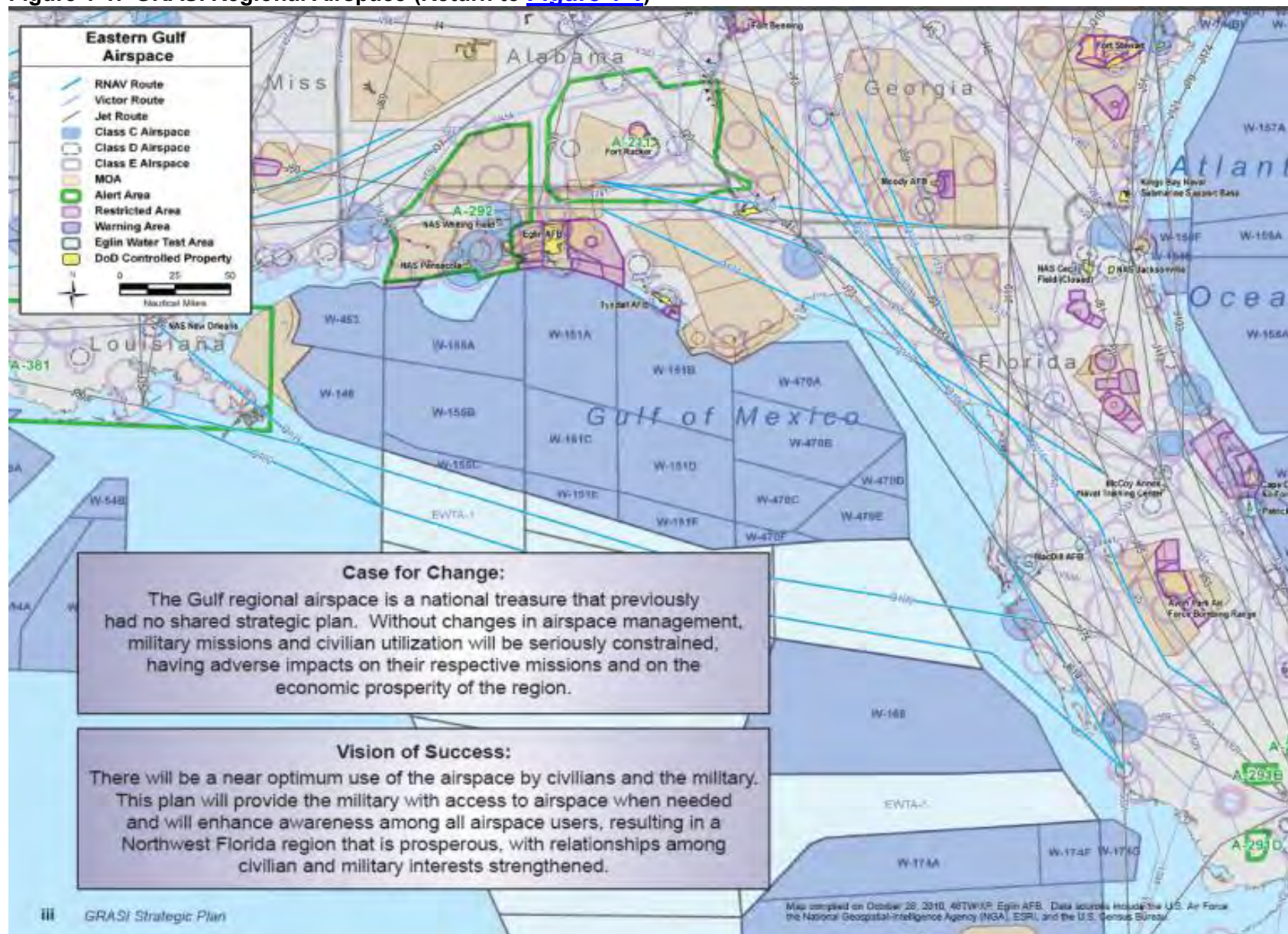
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## **APPENDIX A PRINTABLE MAPS**

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Figure 1-1. GRASI Regional Airspace (Return to [Figure 1-1](#))





**Figure 1-2. Location of Blackwater River and Tate's Hell State Forests (Return to [Figure 1-2](#))**

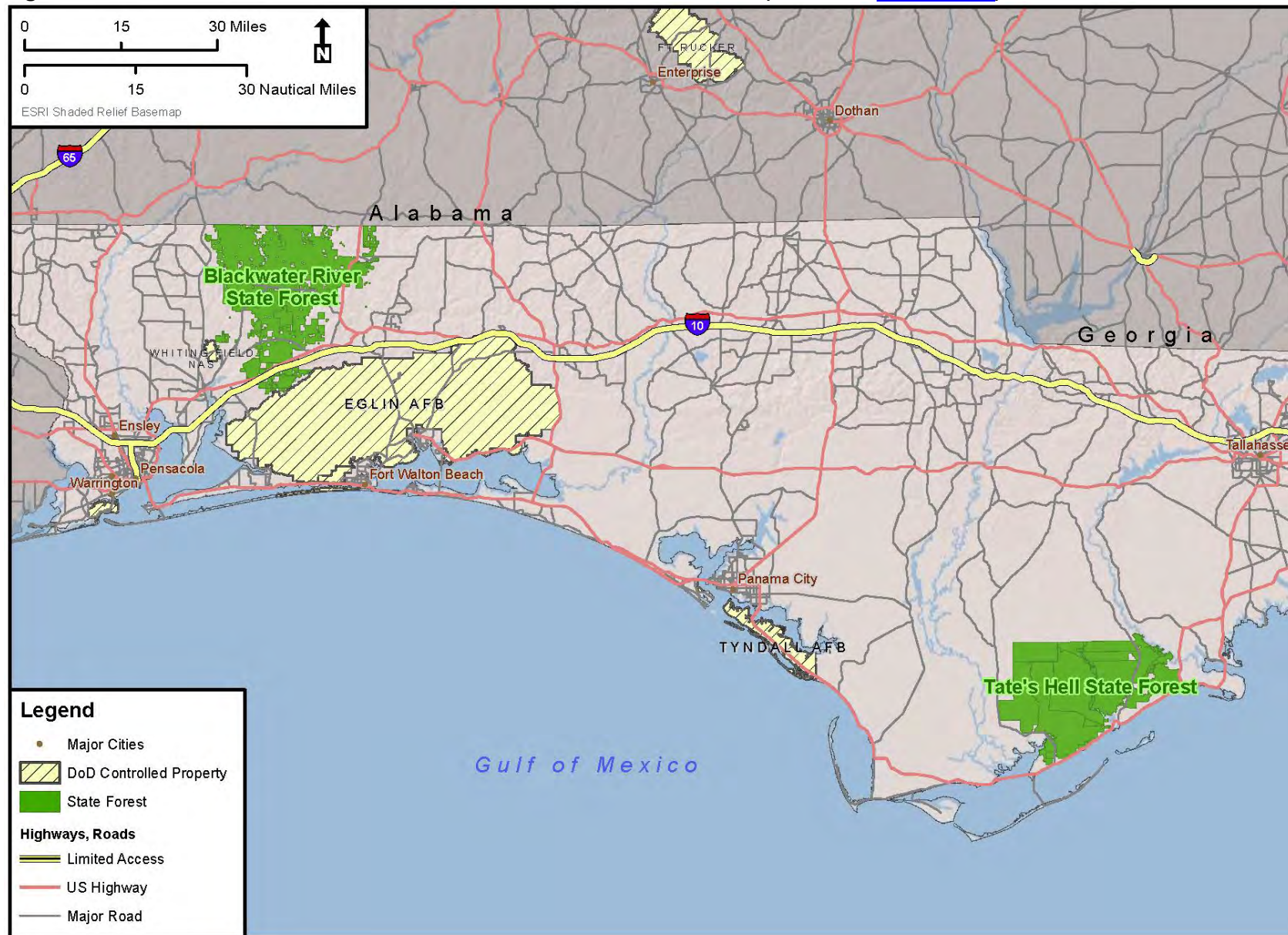


Figure 2-1. Potential Emitter Sites (Return to [Figure 2-1](#))

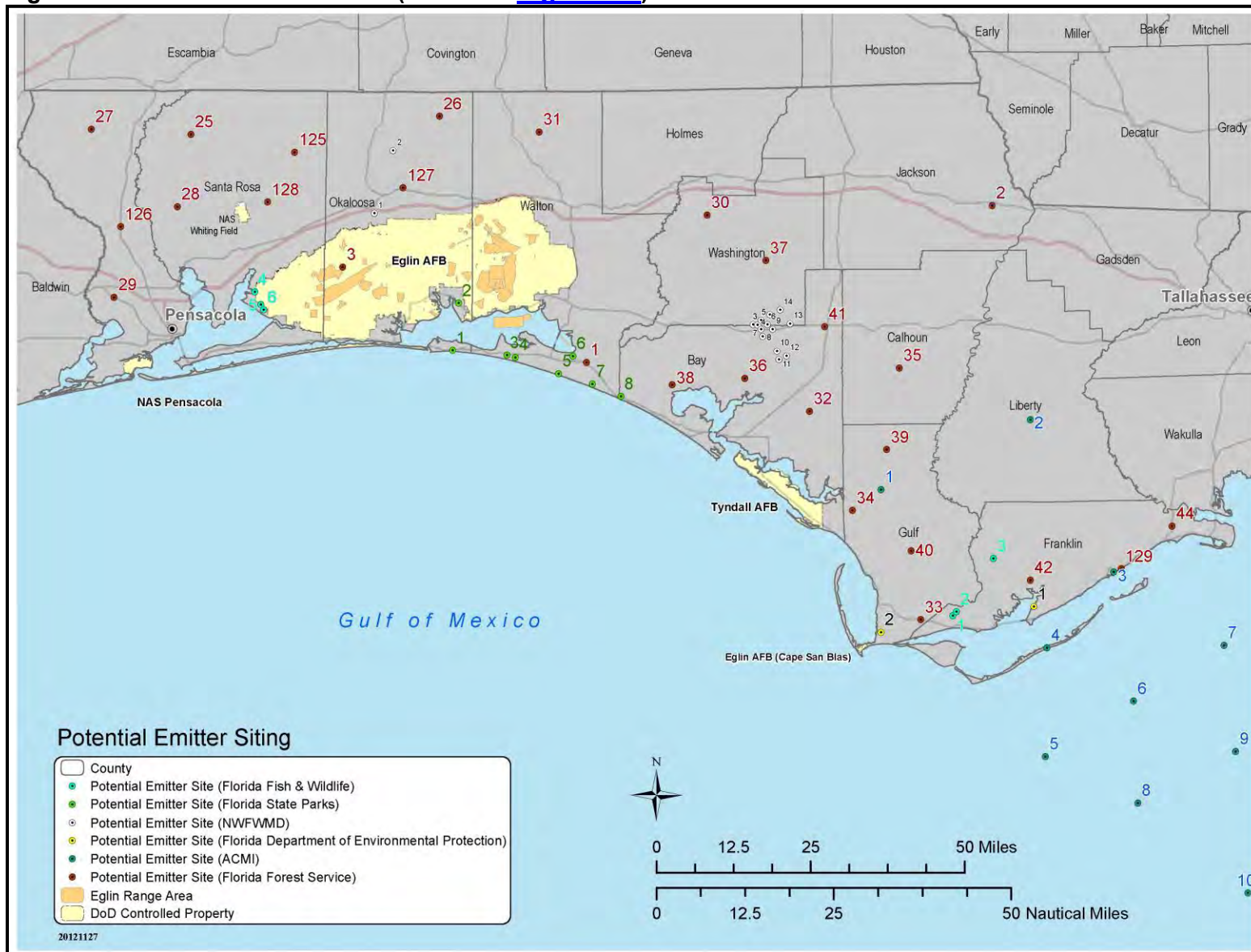




Figure 2-2. Federal and State Lands Within 150-Nautical Mile Radius of Eglin AFB (Return to [Figure 2-2](#))





Figure 2-3. BRSF – Eliminated LZ/DZ (BW1) (Return to [Figure 2-3](#))

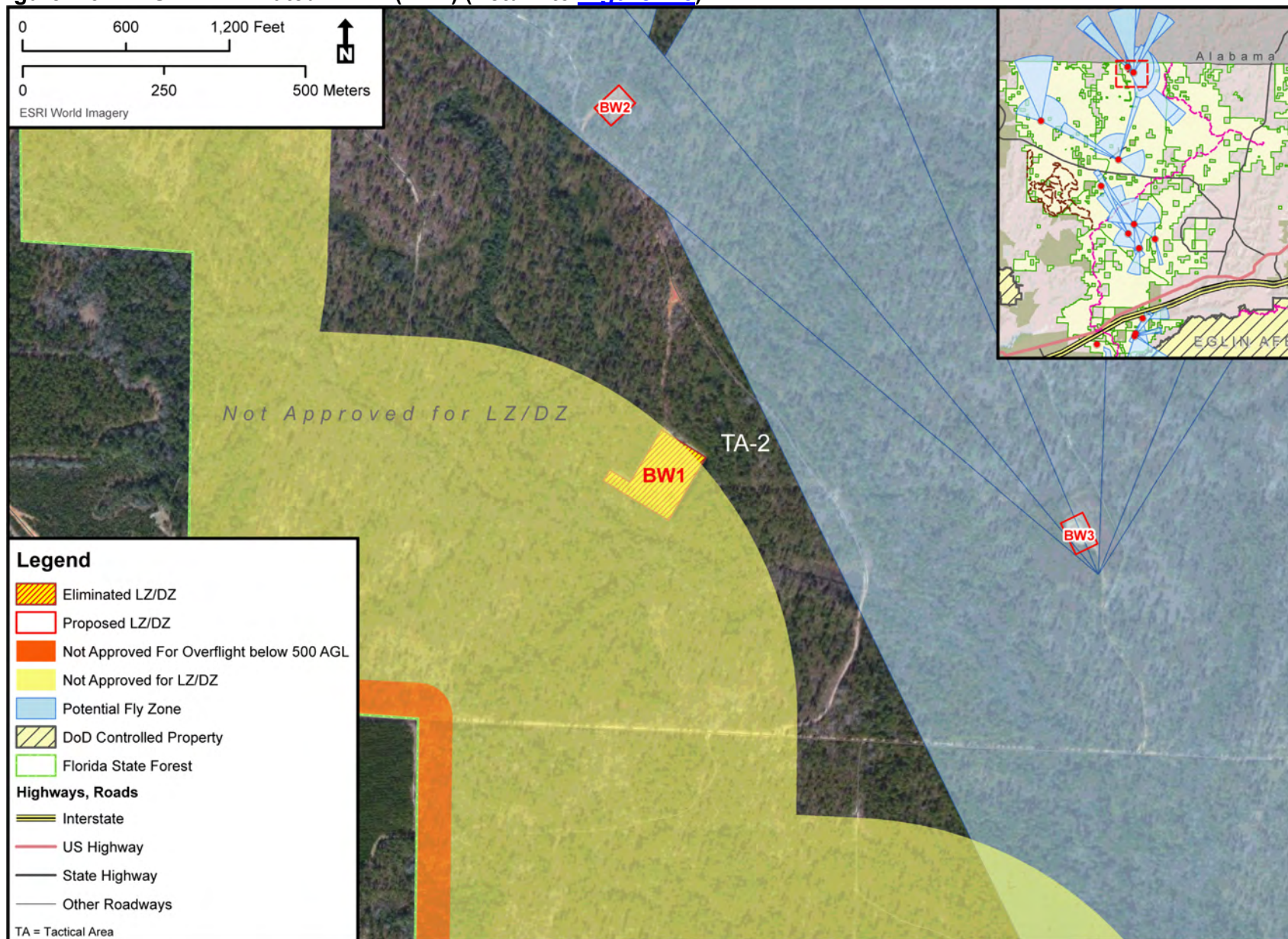




Figure 2-4. THSF – Eliminated LZ/DZ (TH3) (Return to [Figure 2-4](#))

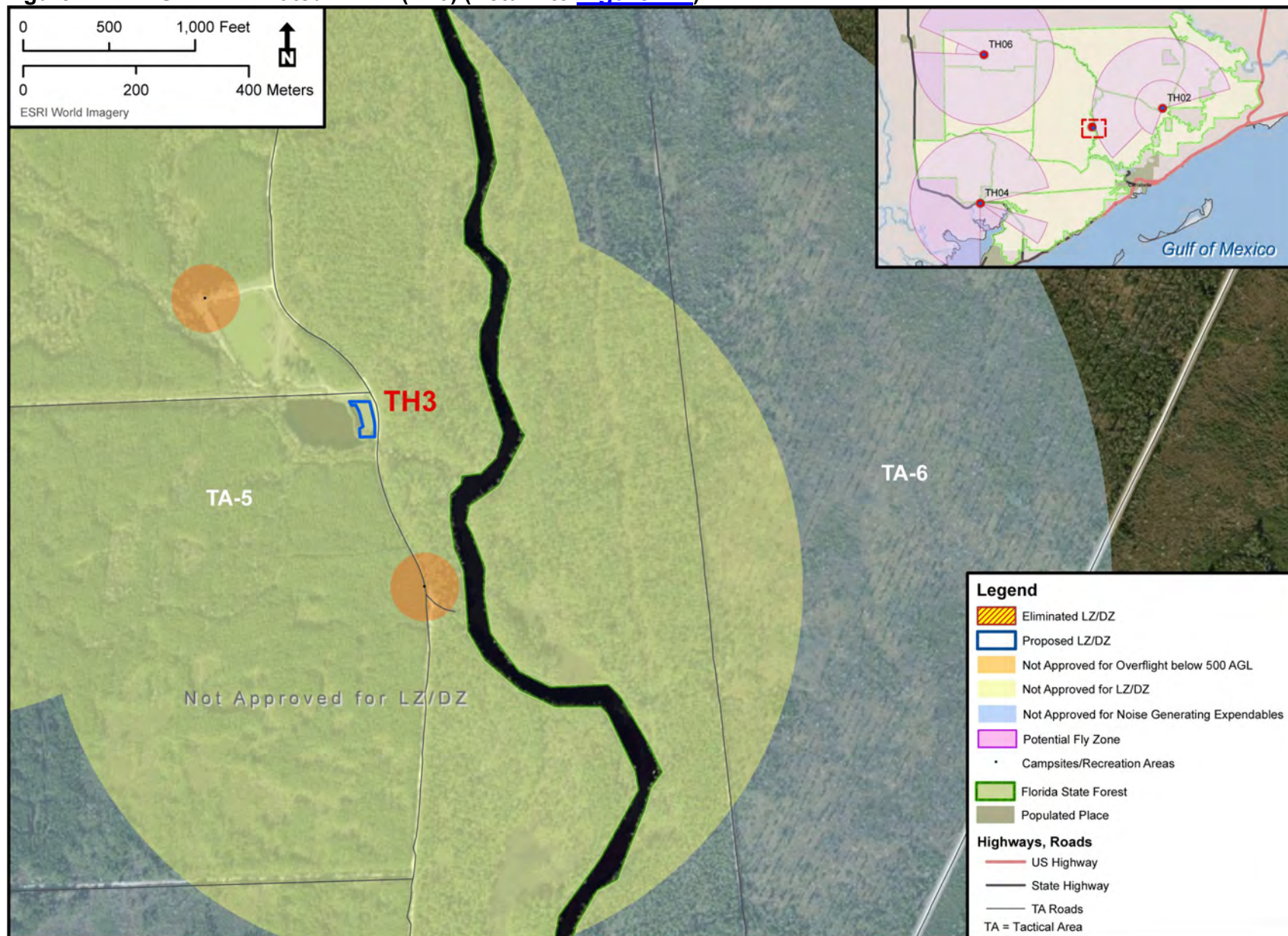
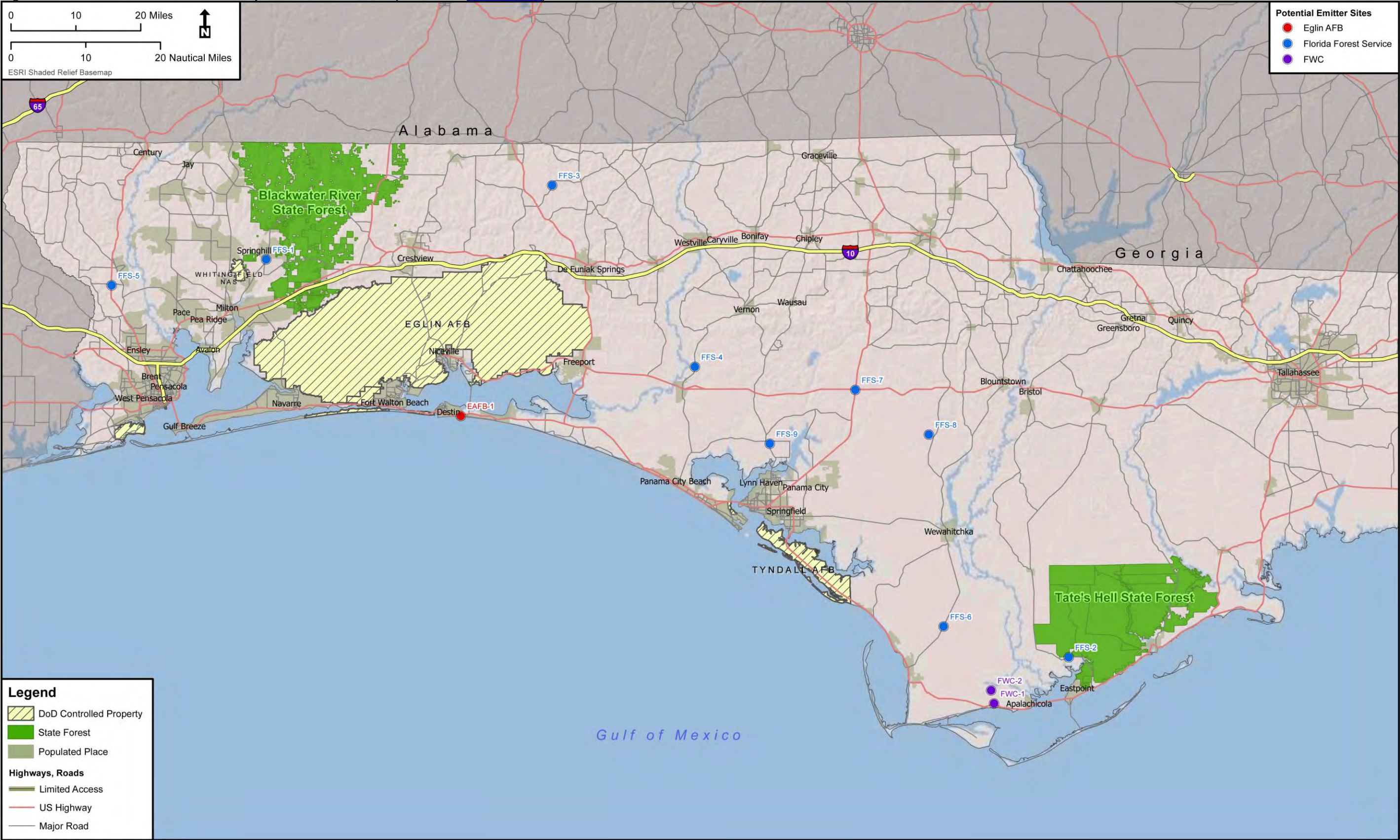




Figure 2-5. Location Overview of Proposed Emitter Sites (Return to [Figure 2-5](#))





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Figure 2-6. Regional View (West) of Proposed Emitter Sites (Return to [Figure 2-6](#))

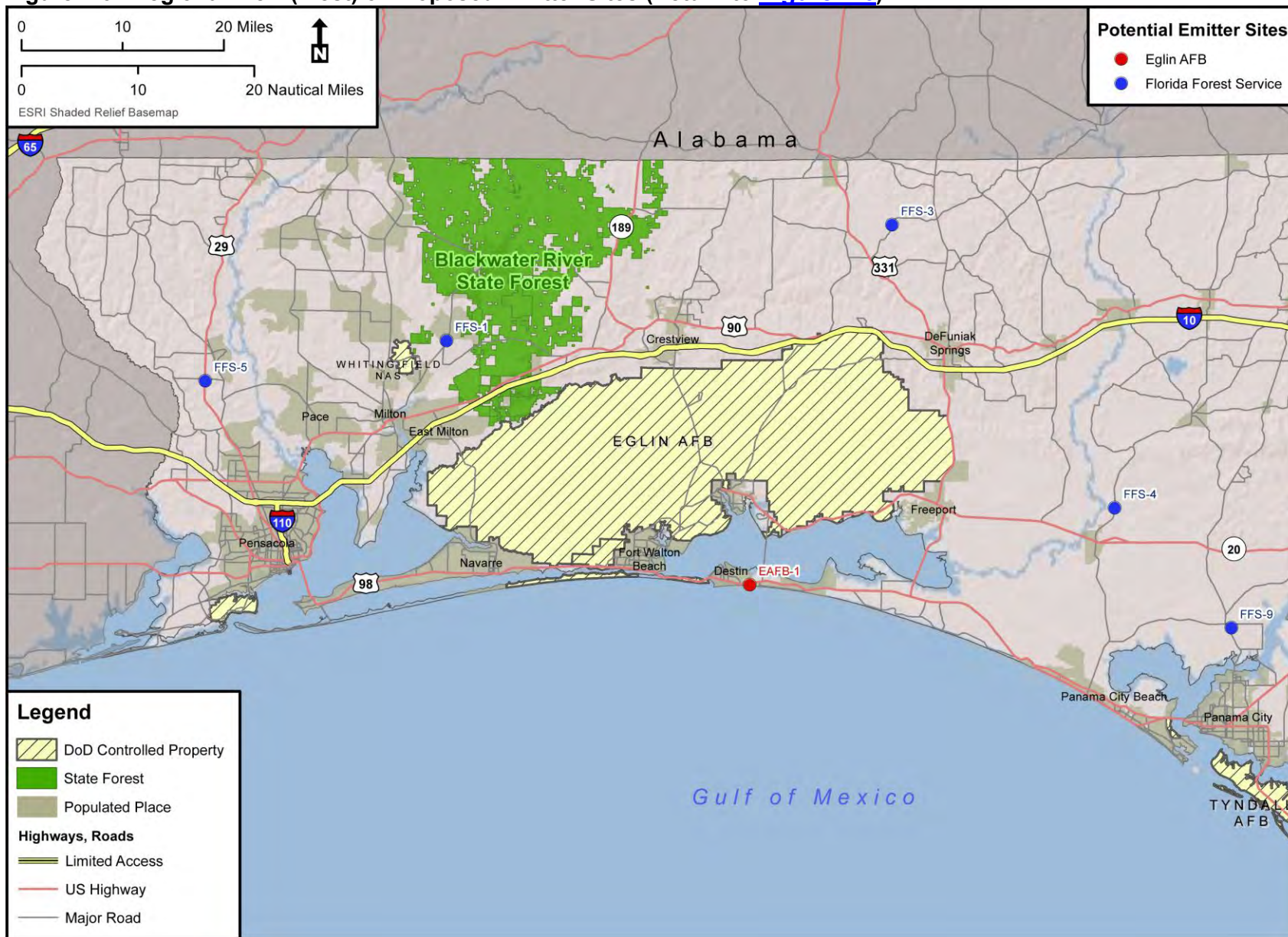


Figure 2-7. Regional View (East) of Proposed Emitter Sites (Return to [Figure 2-7](#))

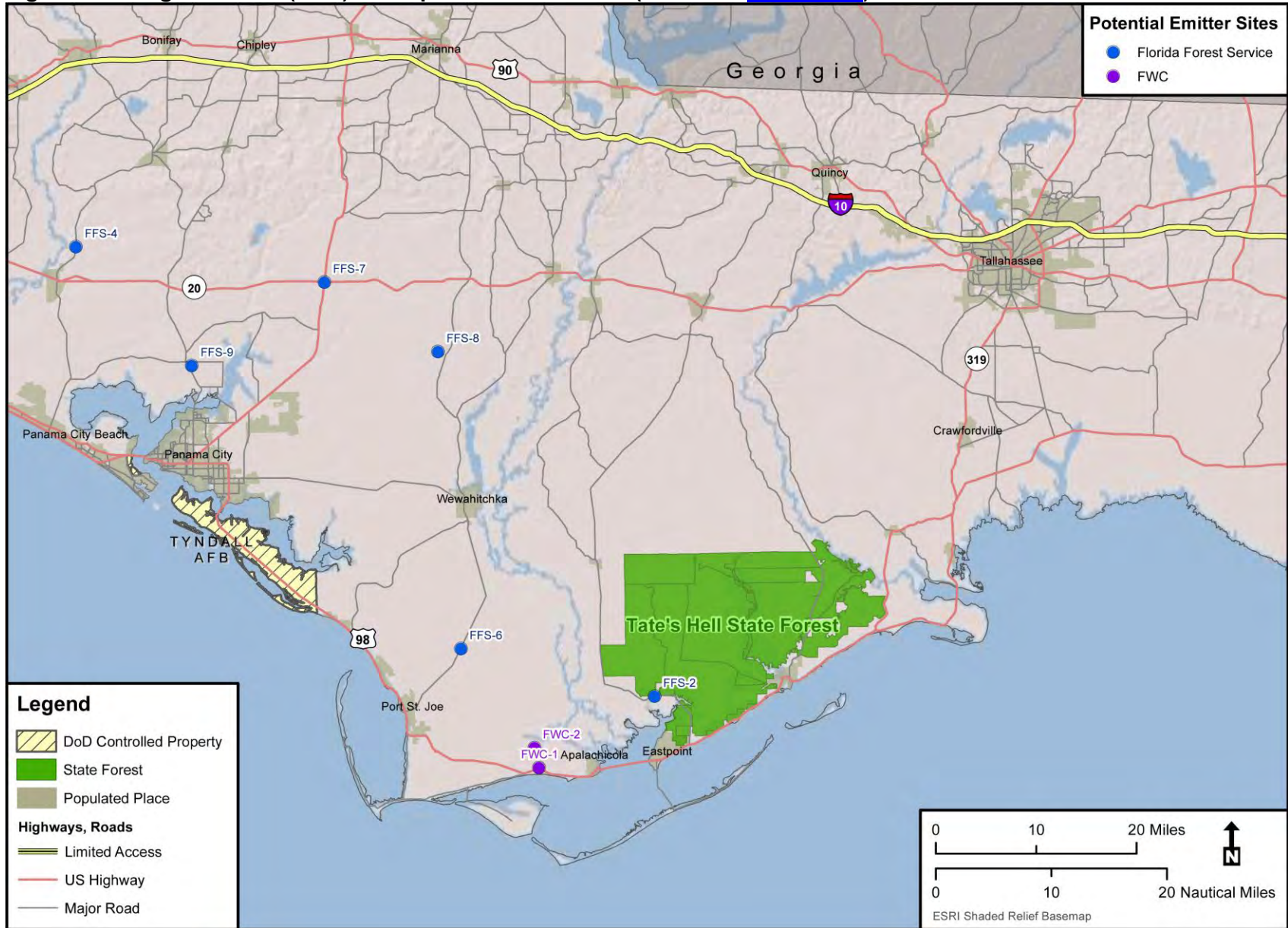




Figure 2-8. Subalternative 1 Emitter Site (FWC-3) (Return to [Figure 2-8](#))

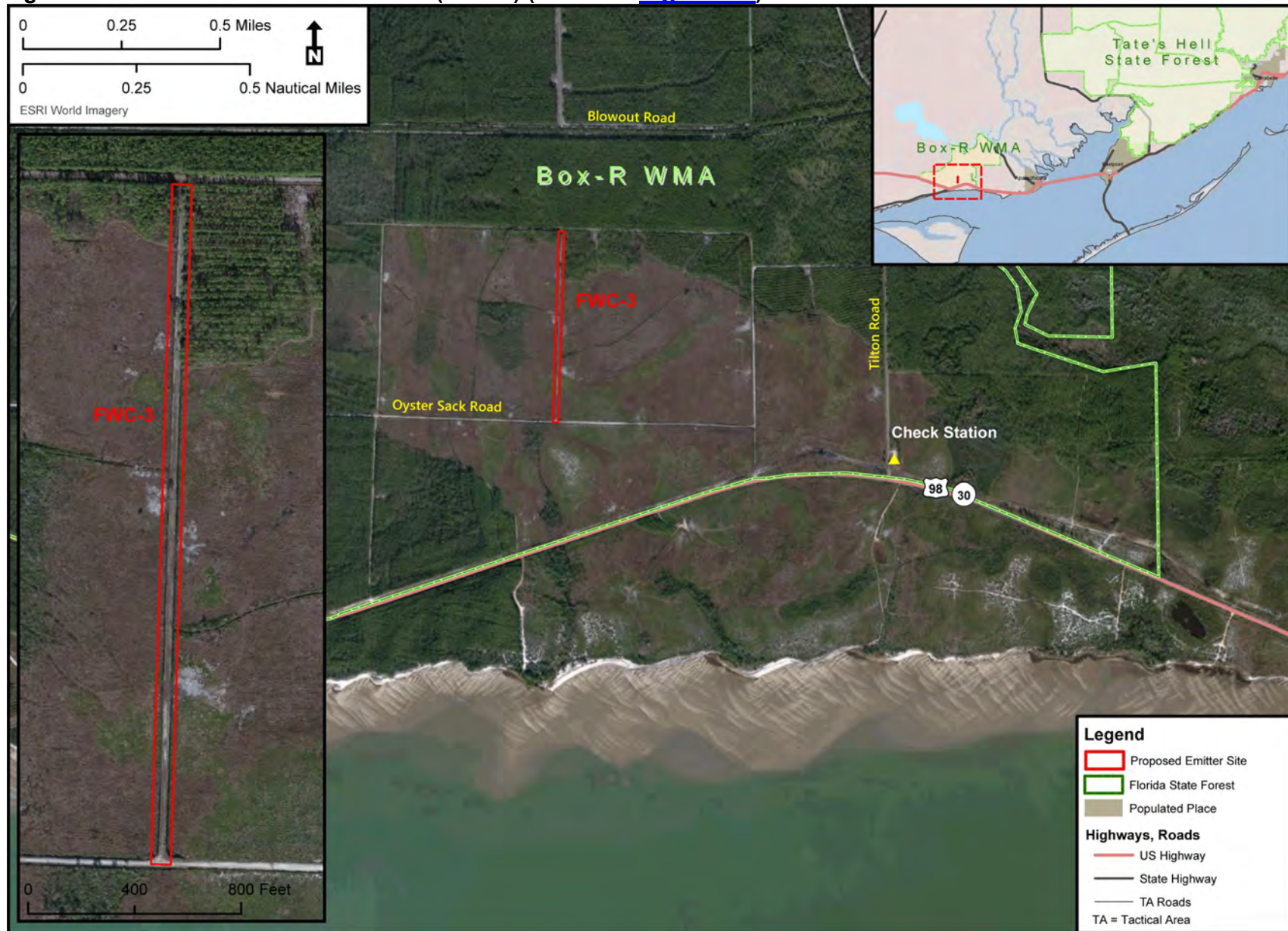




Figure 2-9. BRSF Tactical Areas (Return to [Figure 2-9](#))

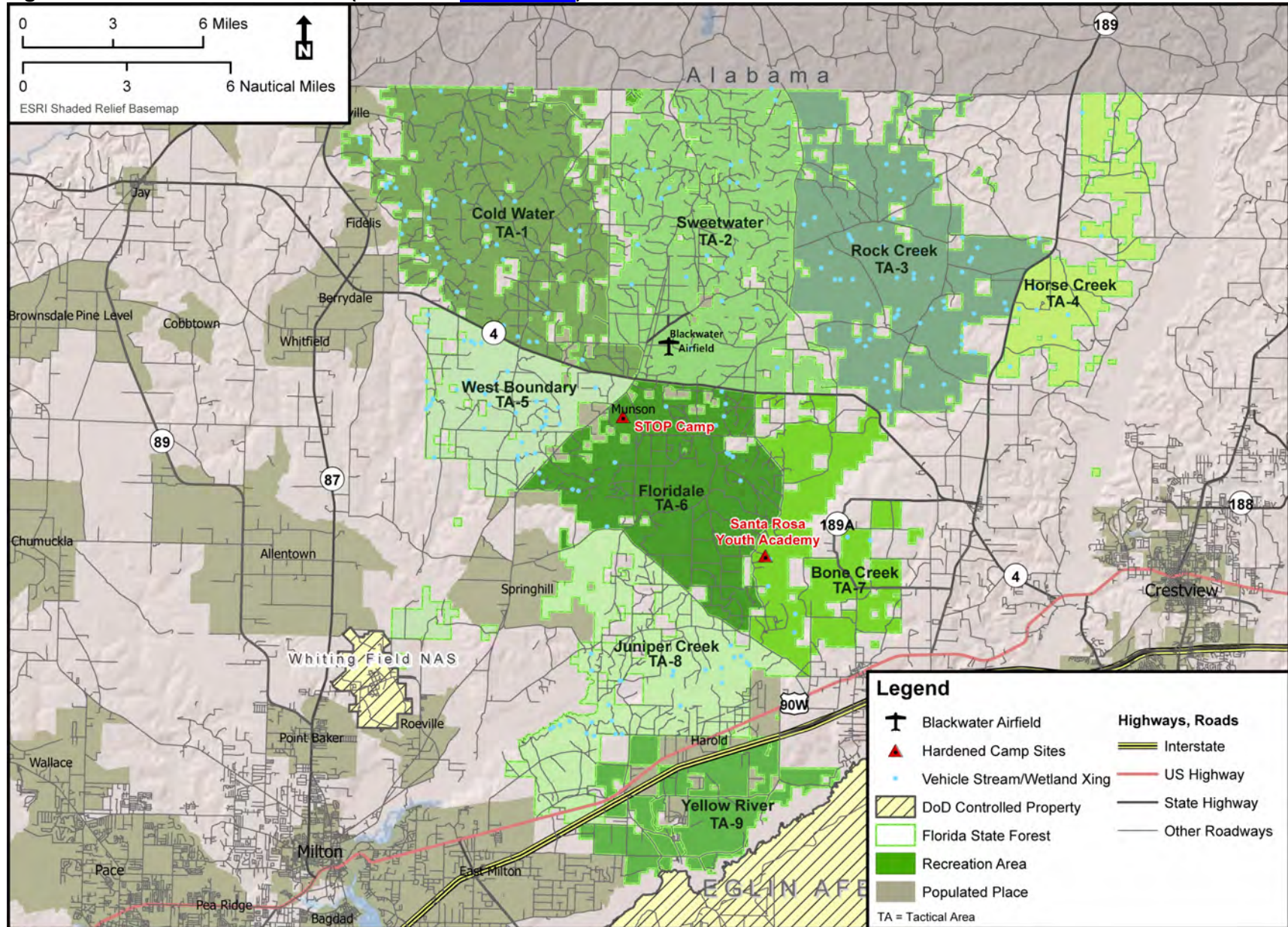




Figure 2-10. THSF Tactical Areas (Return to [Figure 2-10](#))

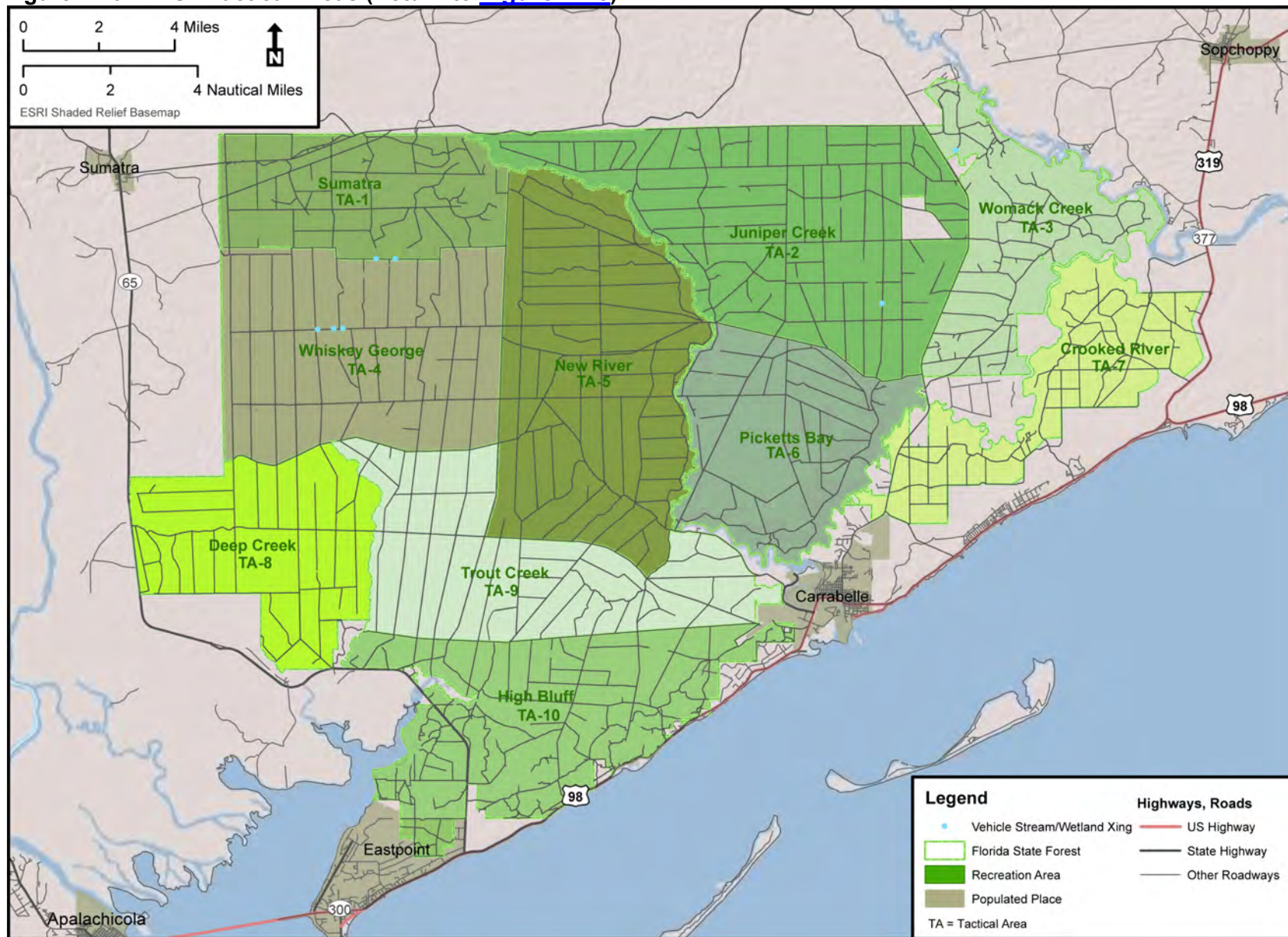
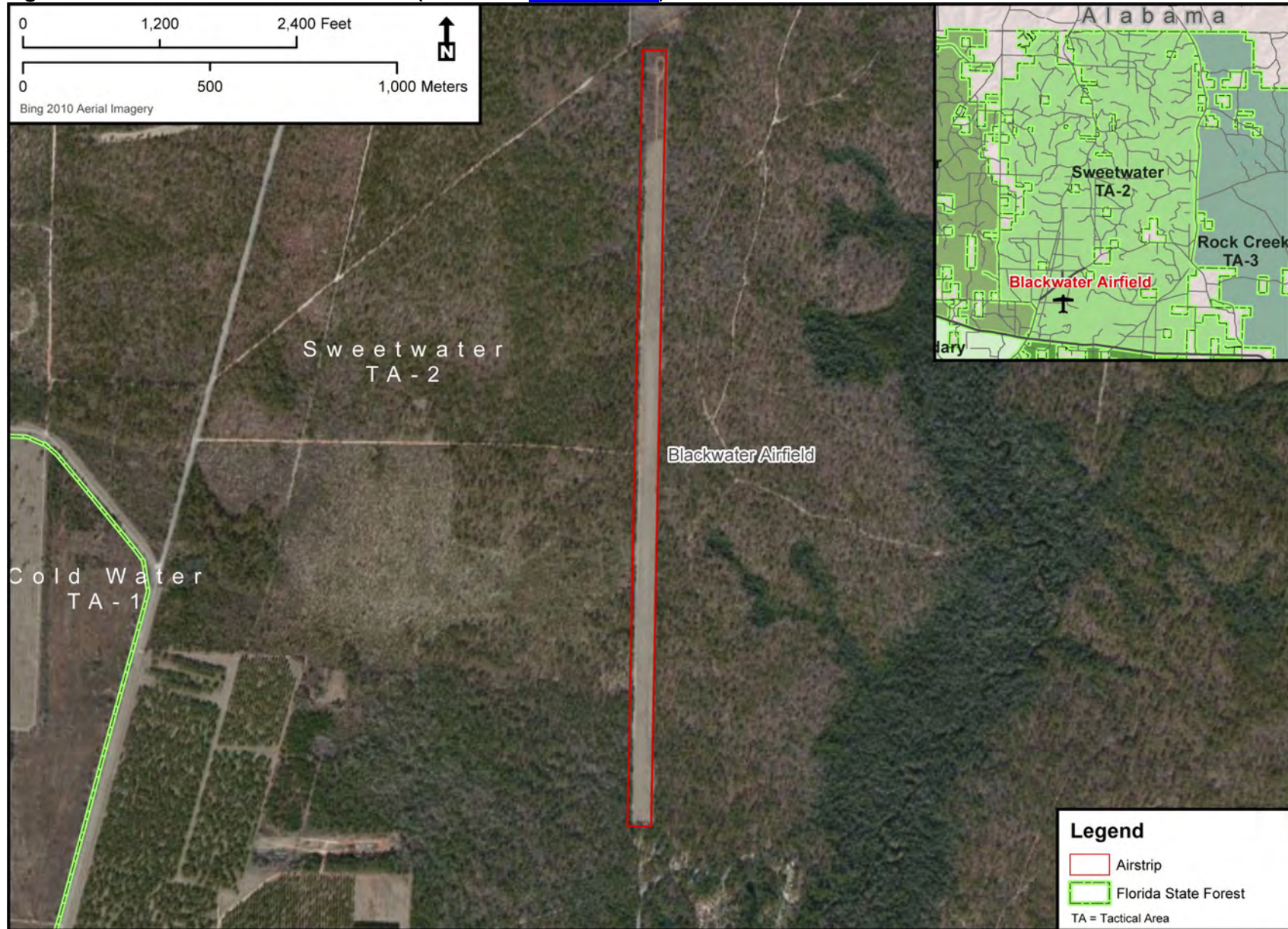




Figure 2-11. BRSF Blackwater Airfield (Return to [Figure 2-11](#))





# FINAL GRASI LANDSCAPE INITIATIVE EIS

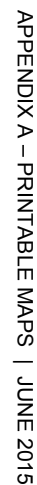




Figure 2-13. BRSF – LZ/DZ BW2 and BW3 (Return to [Figure 2-13](#))

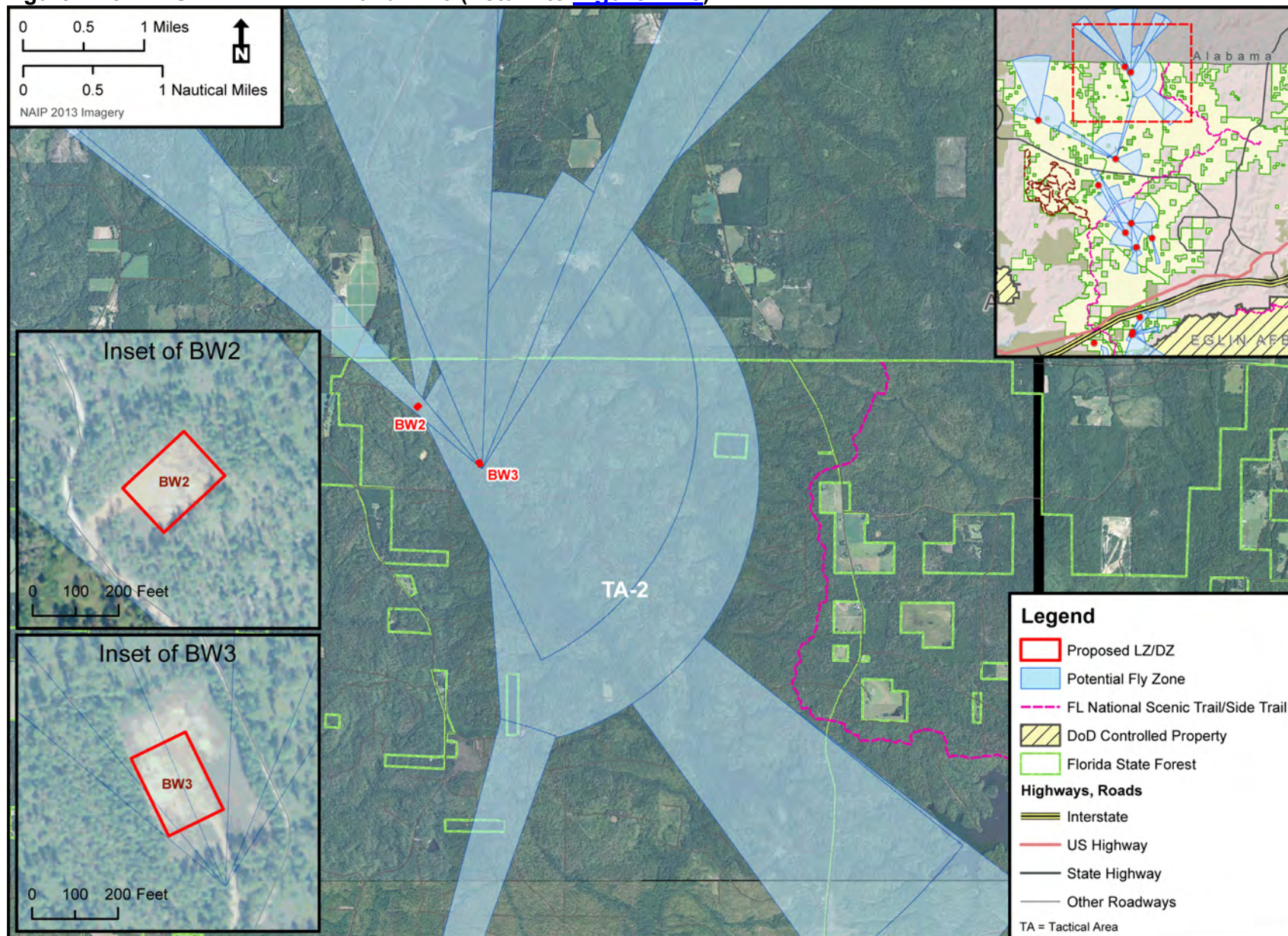




Figure 2-14. BRSF – LZs/DZs BW6, BW7, BW8, BW17 (Return to [Figure 2-14](#))

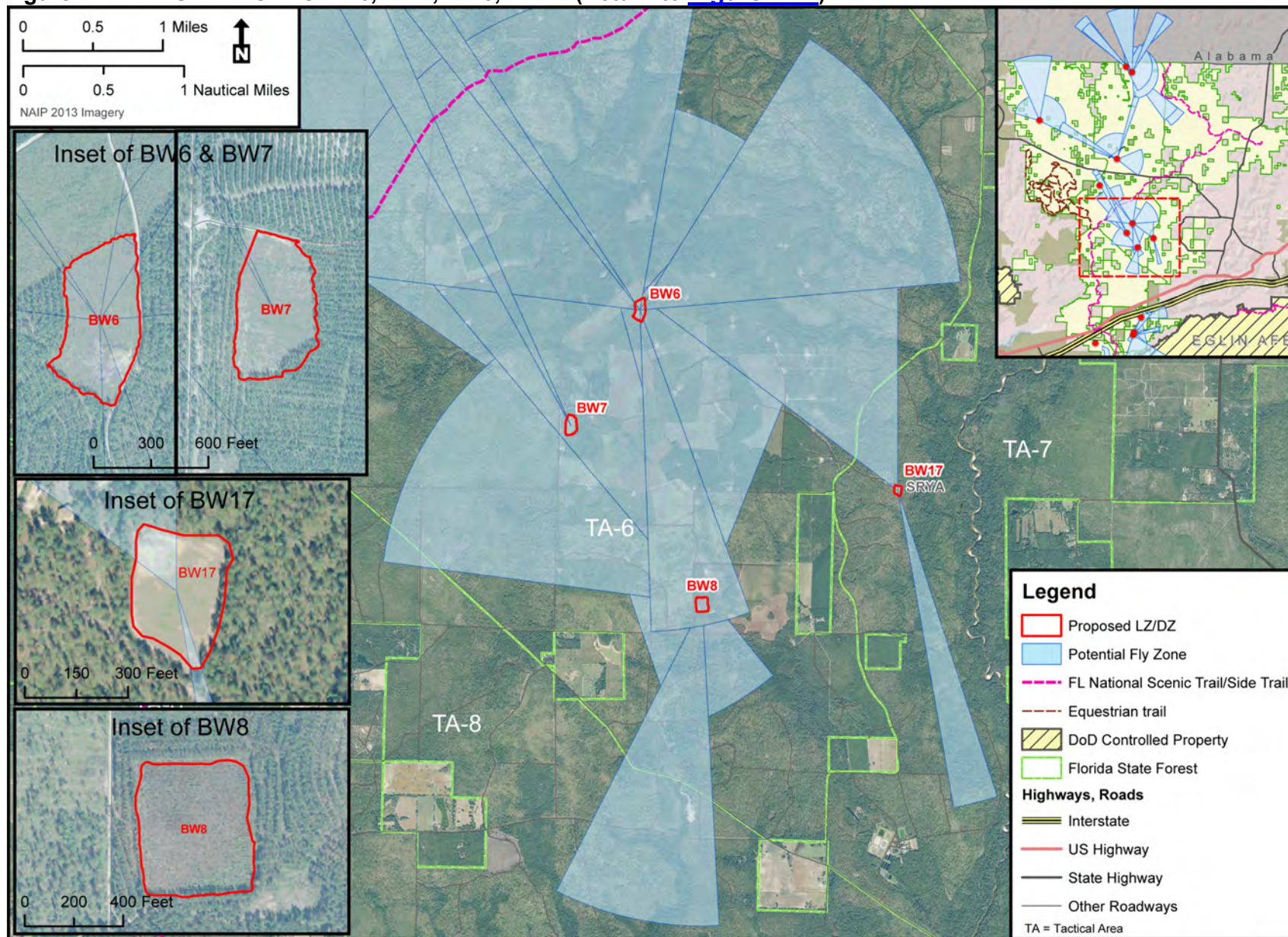




Figure 2-15. BRSF – LZs/DZs BW9, BW10, BW11, BW12 (Return to [Figure 2-15](#))

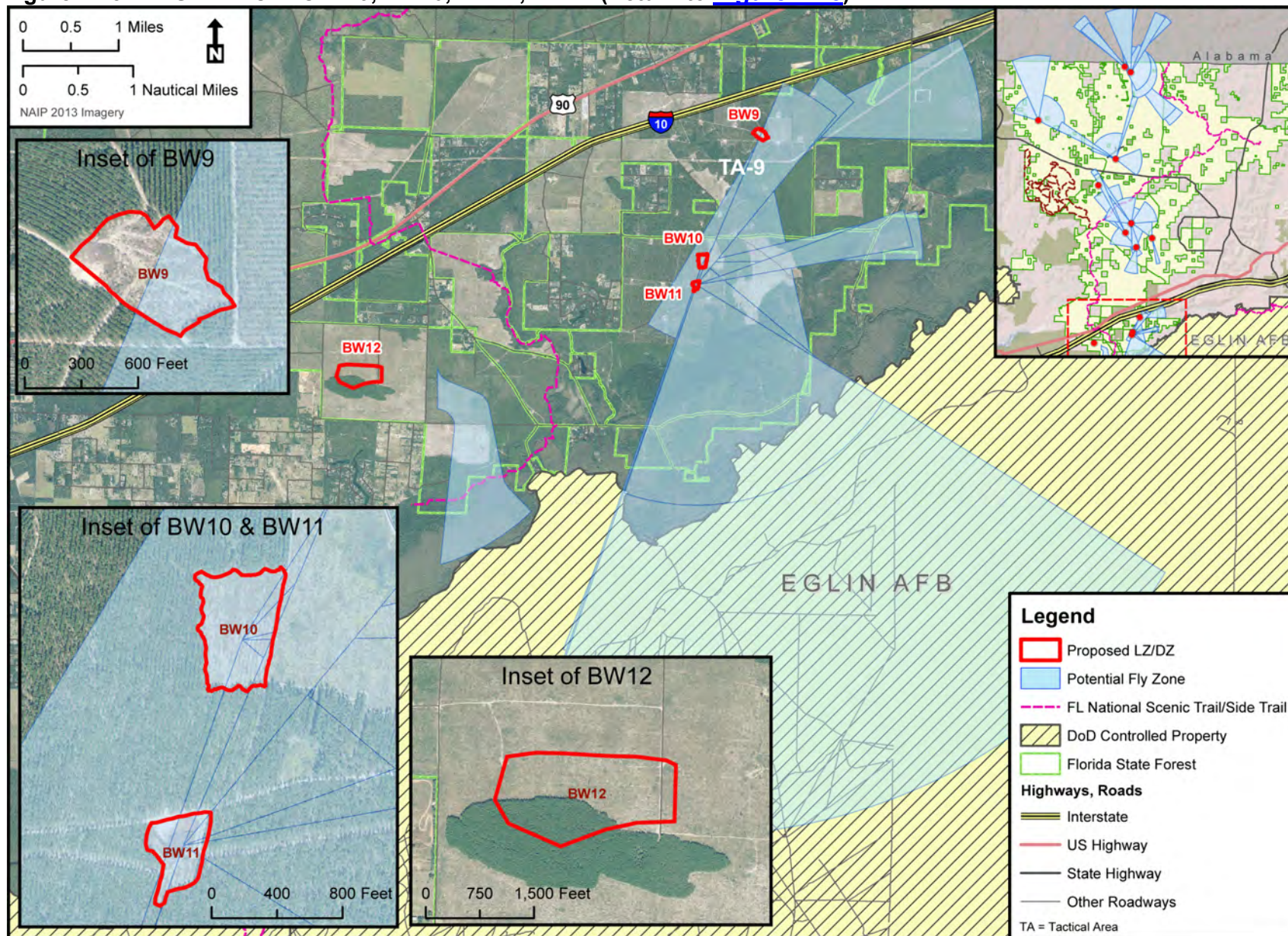




Figure 2-16. BRSF – LZ/DZ BW14 (Return to [Figure 2-16](#))

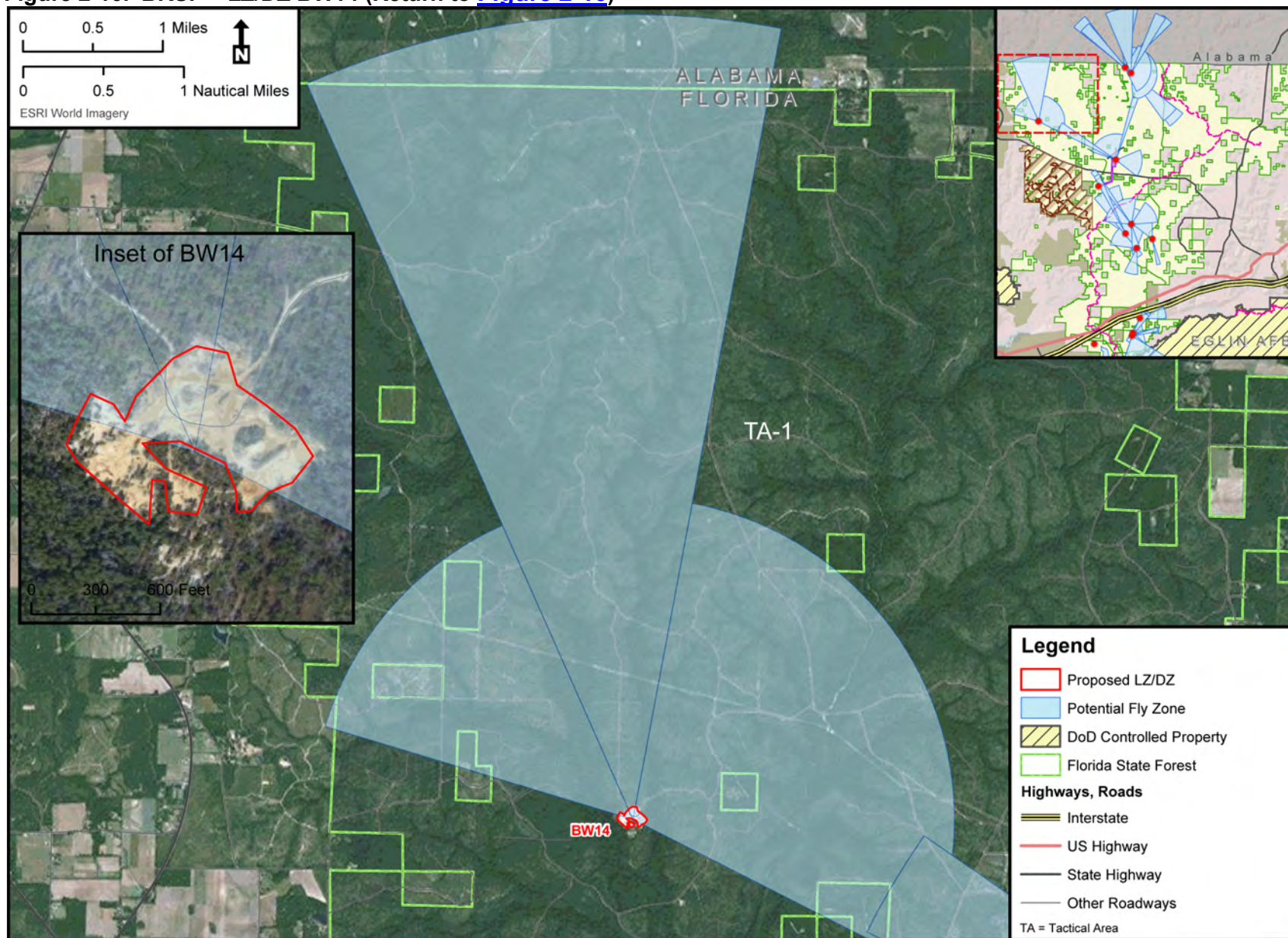




Figure 2-17. BRSF – BW Airfield, LZ/DZ\_BW13 (Return to [Figure 2-17](#))

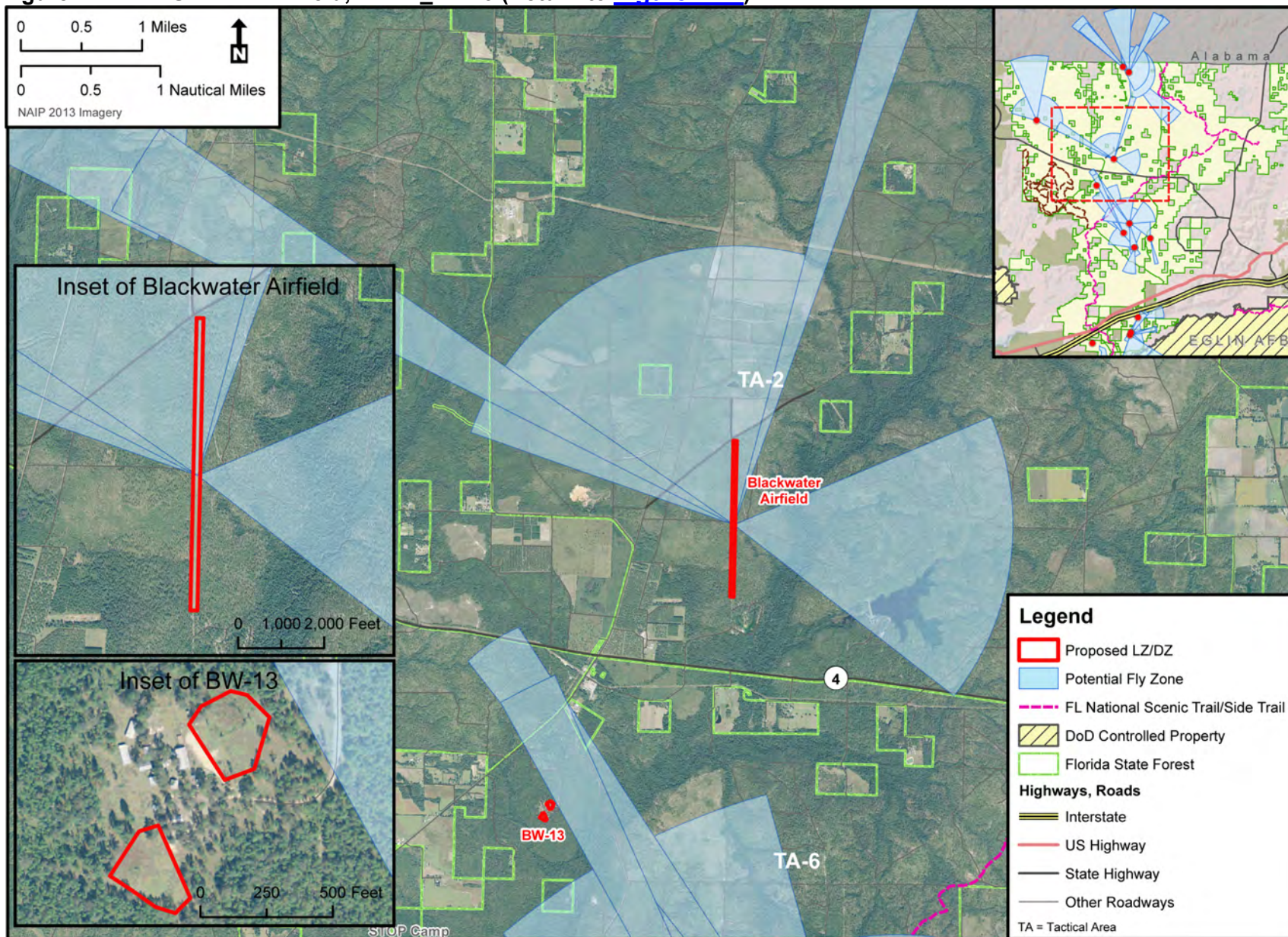




Figure 2-18. THSF Overall LZs/DZs (Return to [Figure 2-18](#))

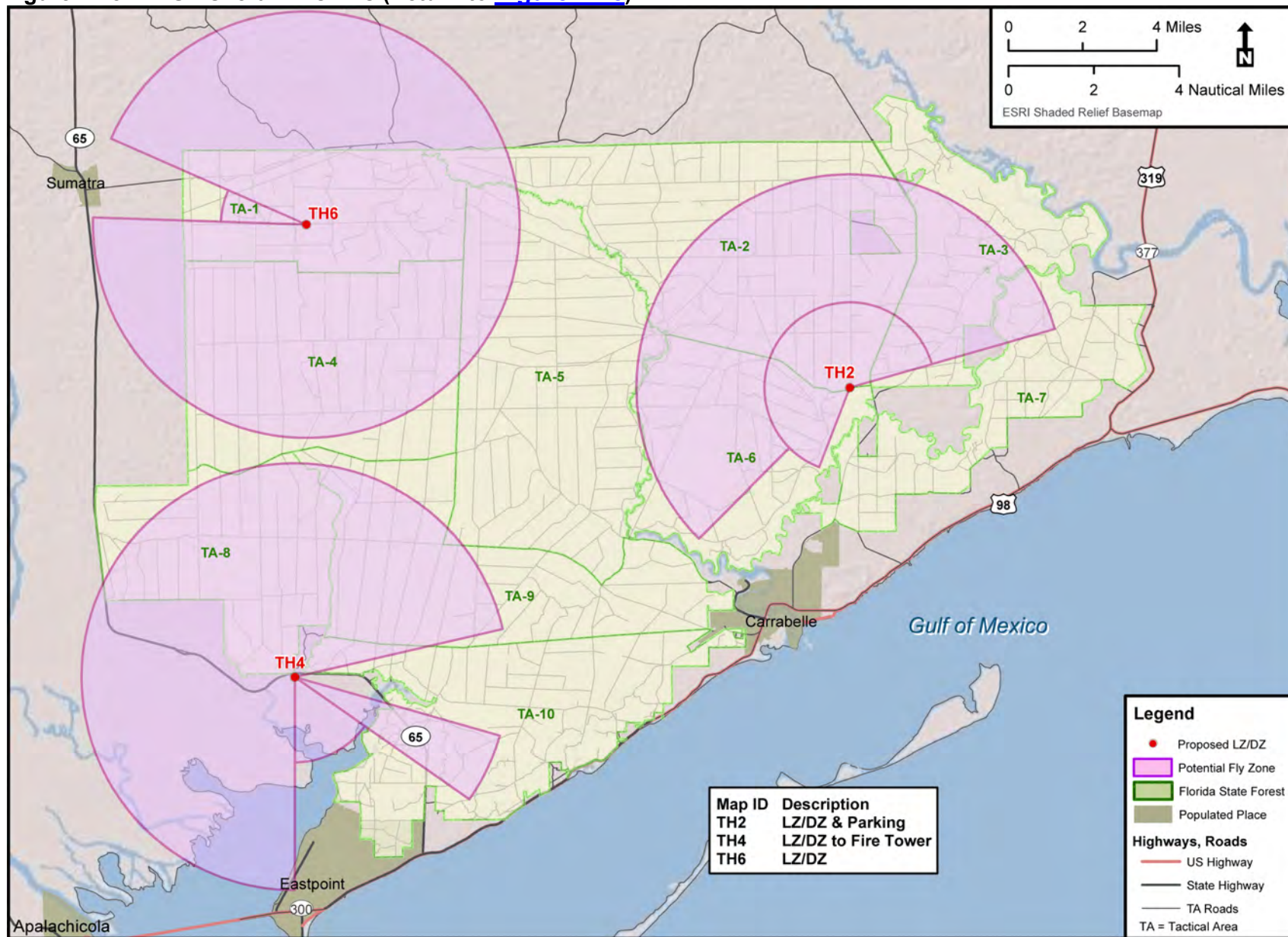




Figure 2-19. THSF – LZ/DZ TH2 (Return to [Figure 2-19](#))

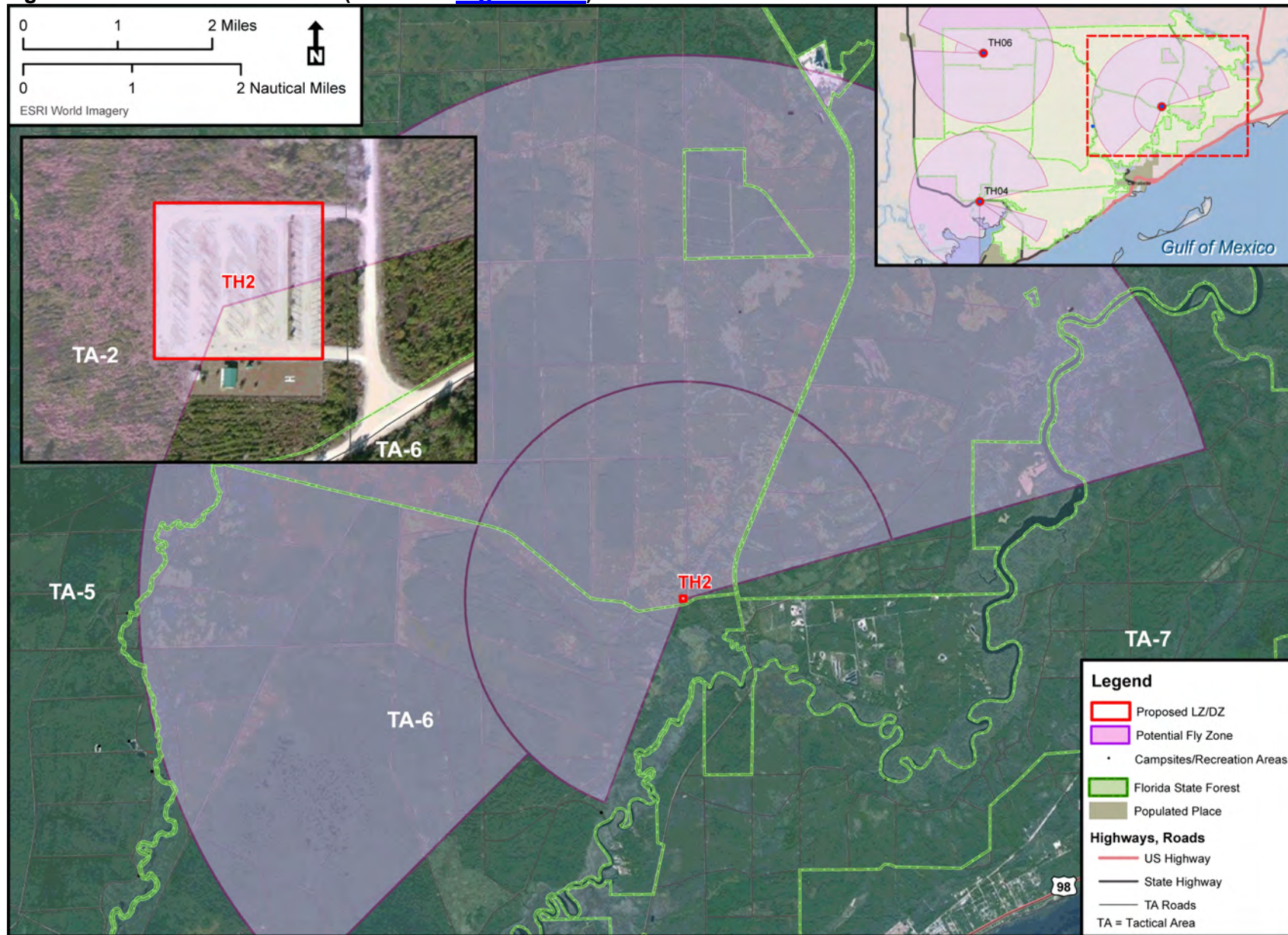




Figure 2-20. THSF – LZ/DZ TH4 (Return to [Figure 2-20](#))

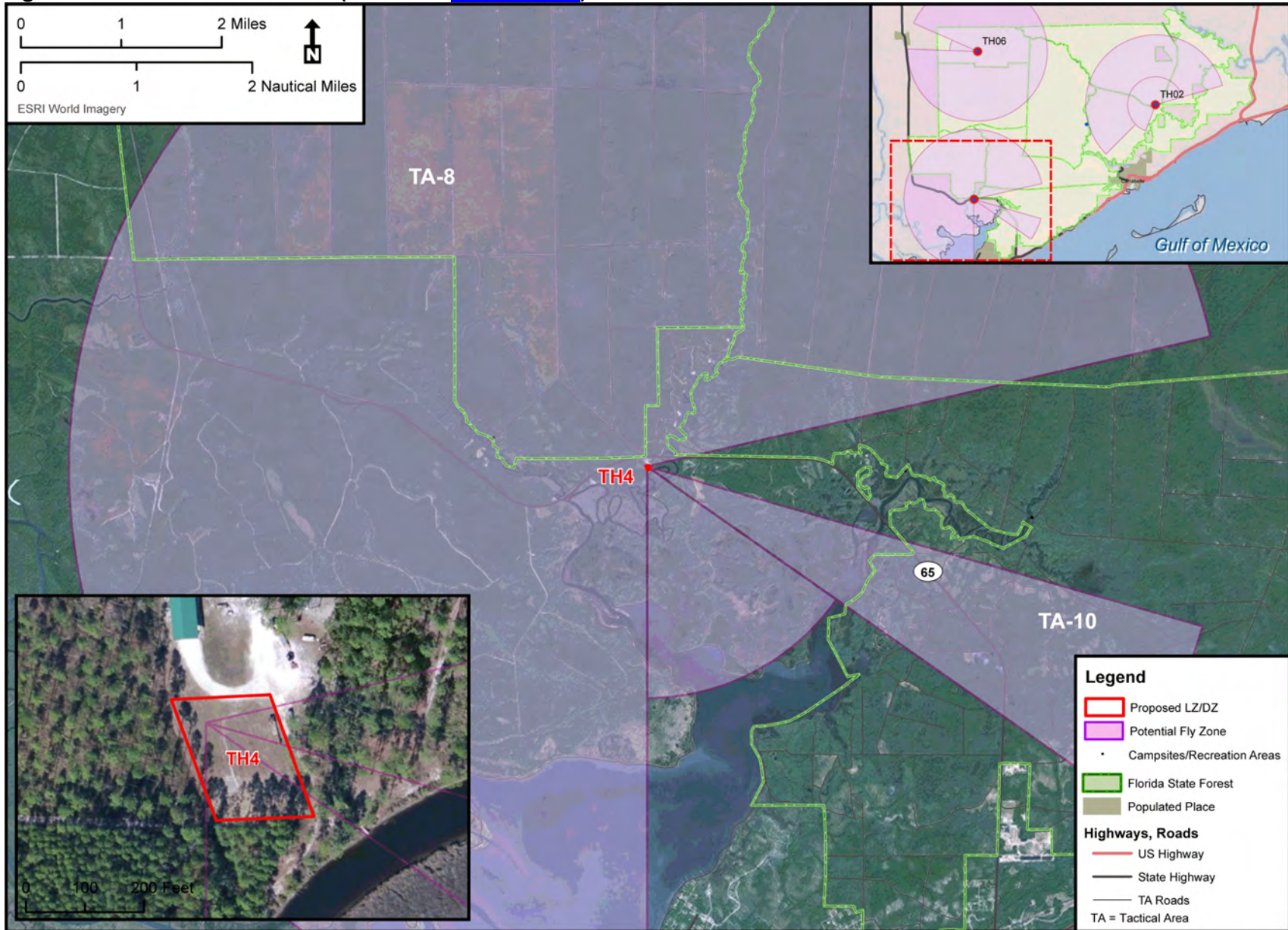




Figure 2-21. THSF – LZ/DZ TH6 (Return to [Figure 2-21](#))

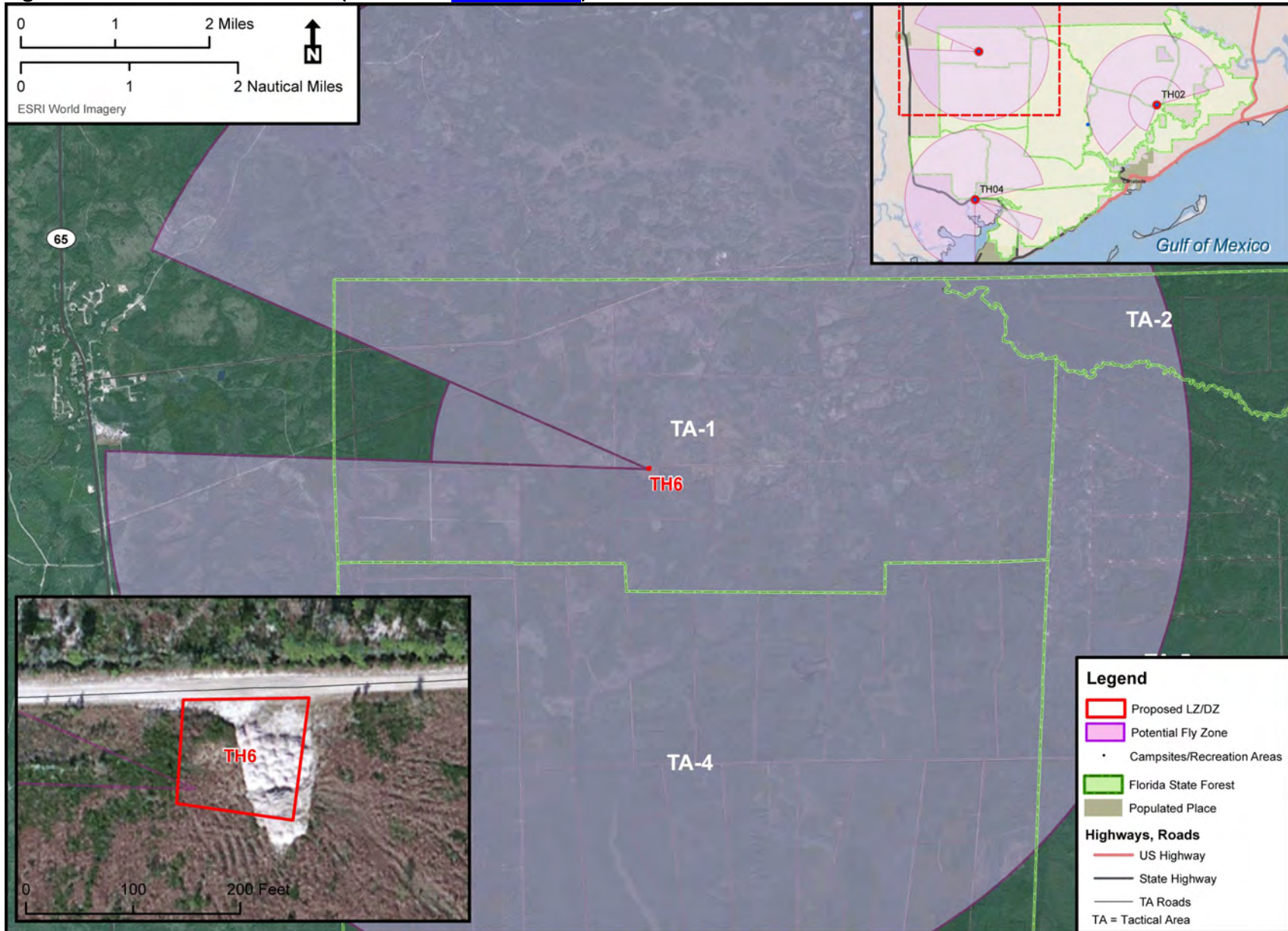




Figure 2-22. Subalternative 1 CCDM Corridor (Return to [Figure 2-22](#))

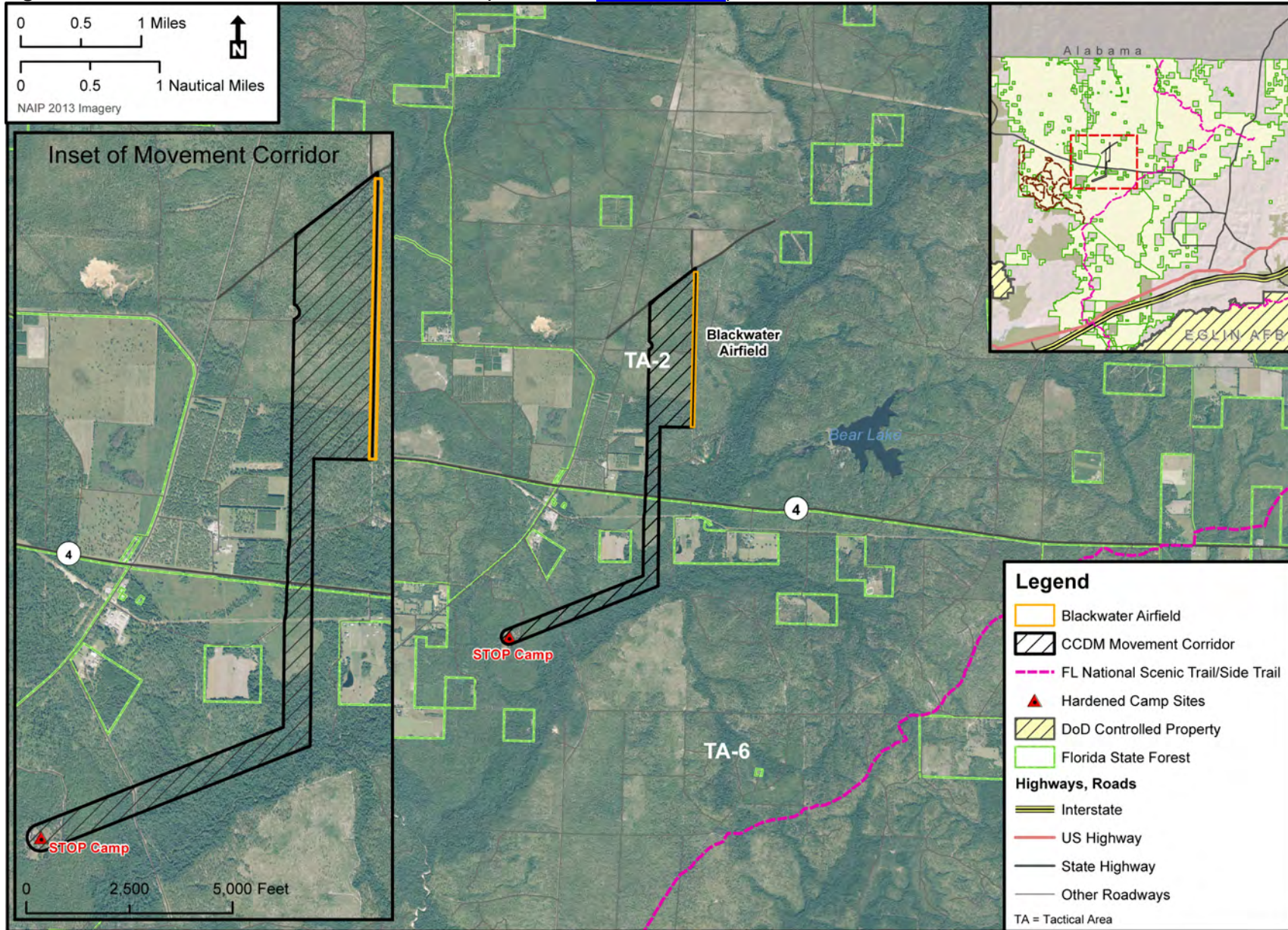


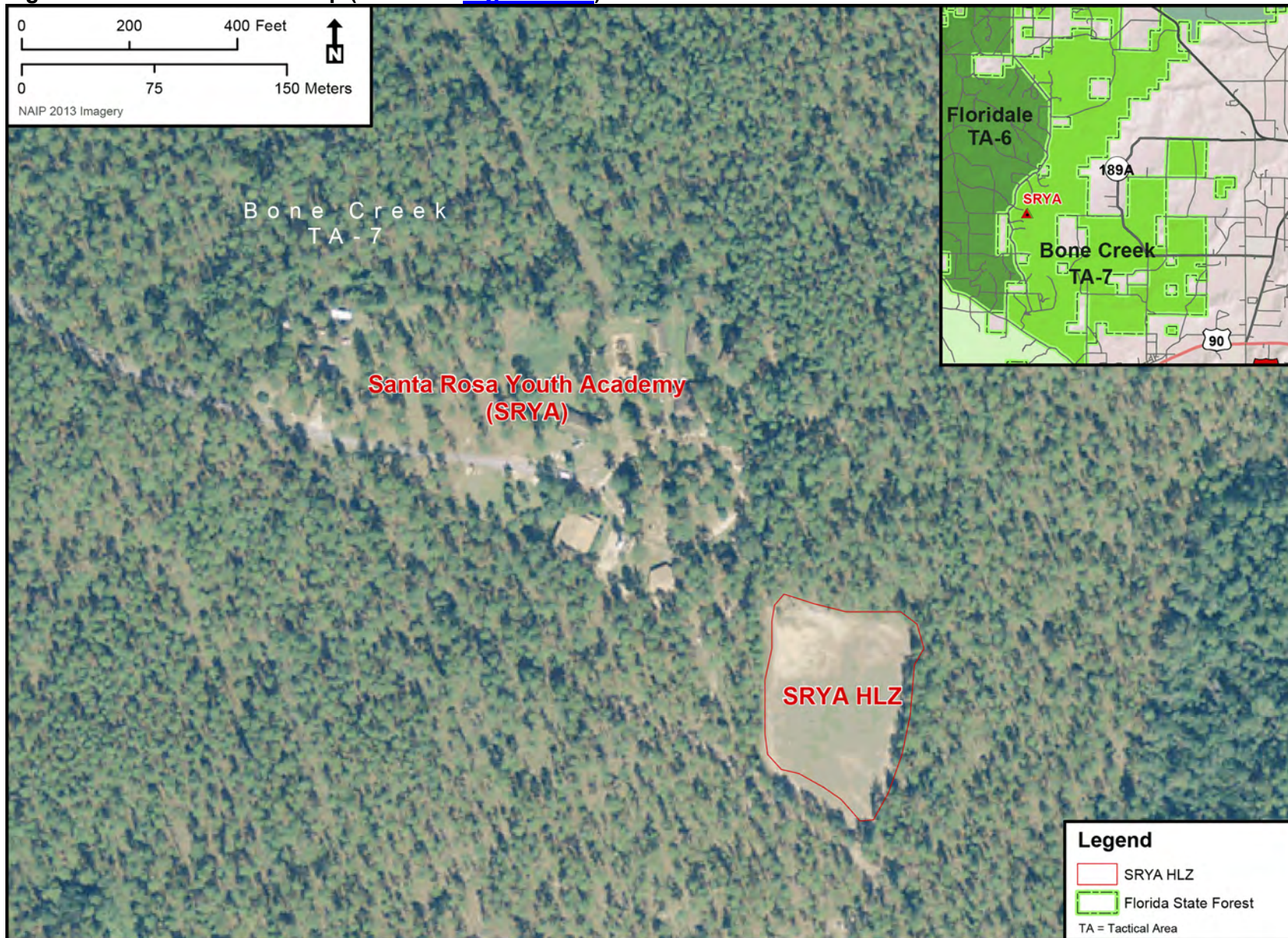


Figure 2-23. BRSF STOP Camp (Return to [Figure 2-23](#))





Figure 2-24. BRSF SRYA Camp (Return to [Figure 2-24](#))





**Figure 5-1. BRSF Ground Operations Protection Levels (Return to [Figure 5-1](#))**

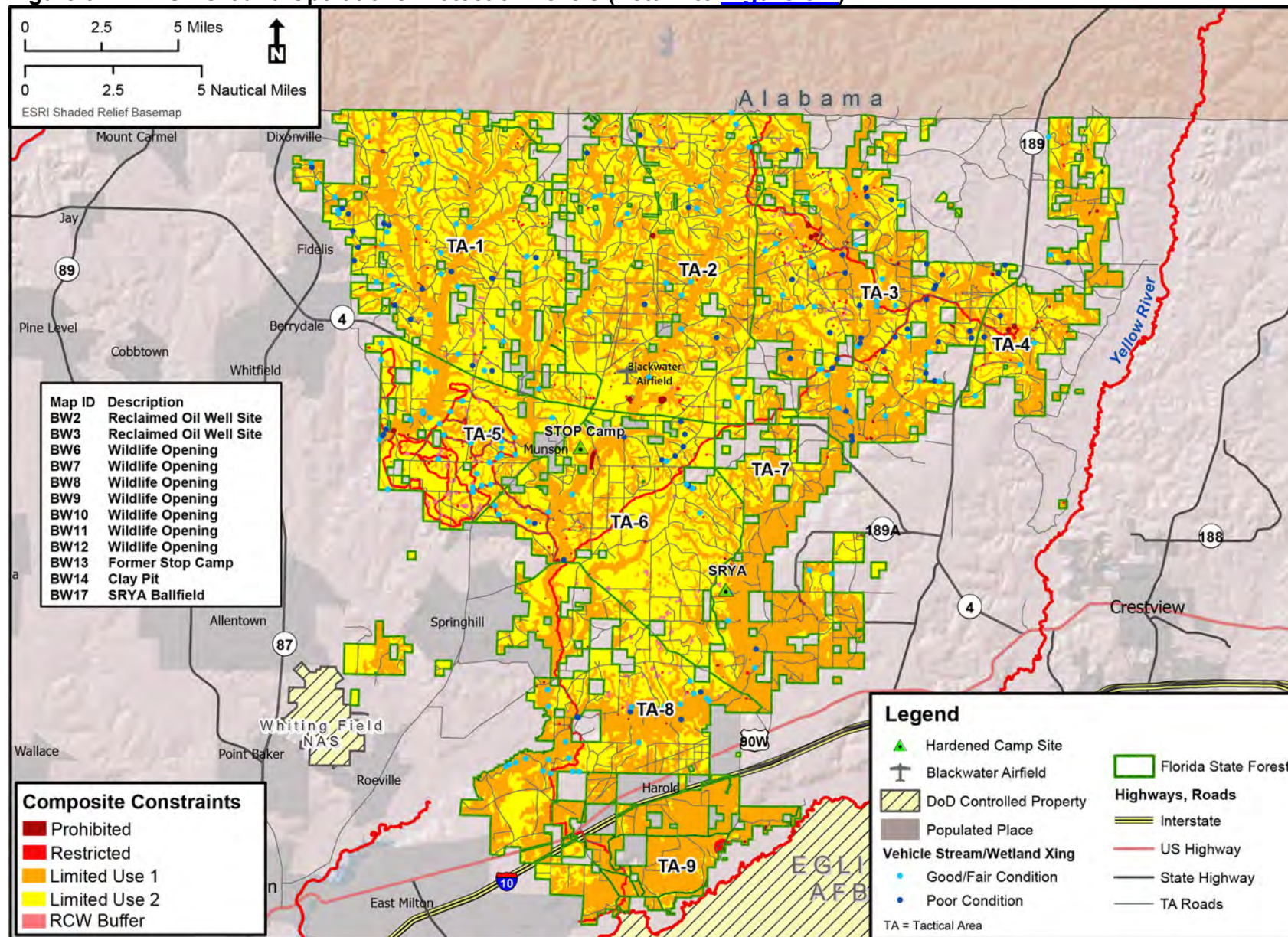




Figure 5-2. BRSF TA-1 Ground Operations Protection Levels (Return to [Figure 5-2](#))

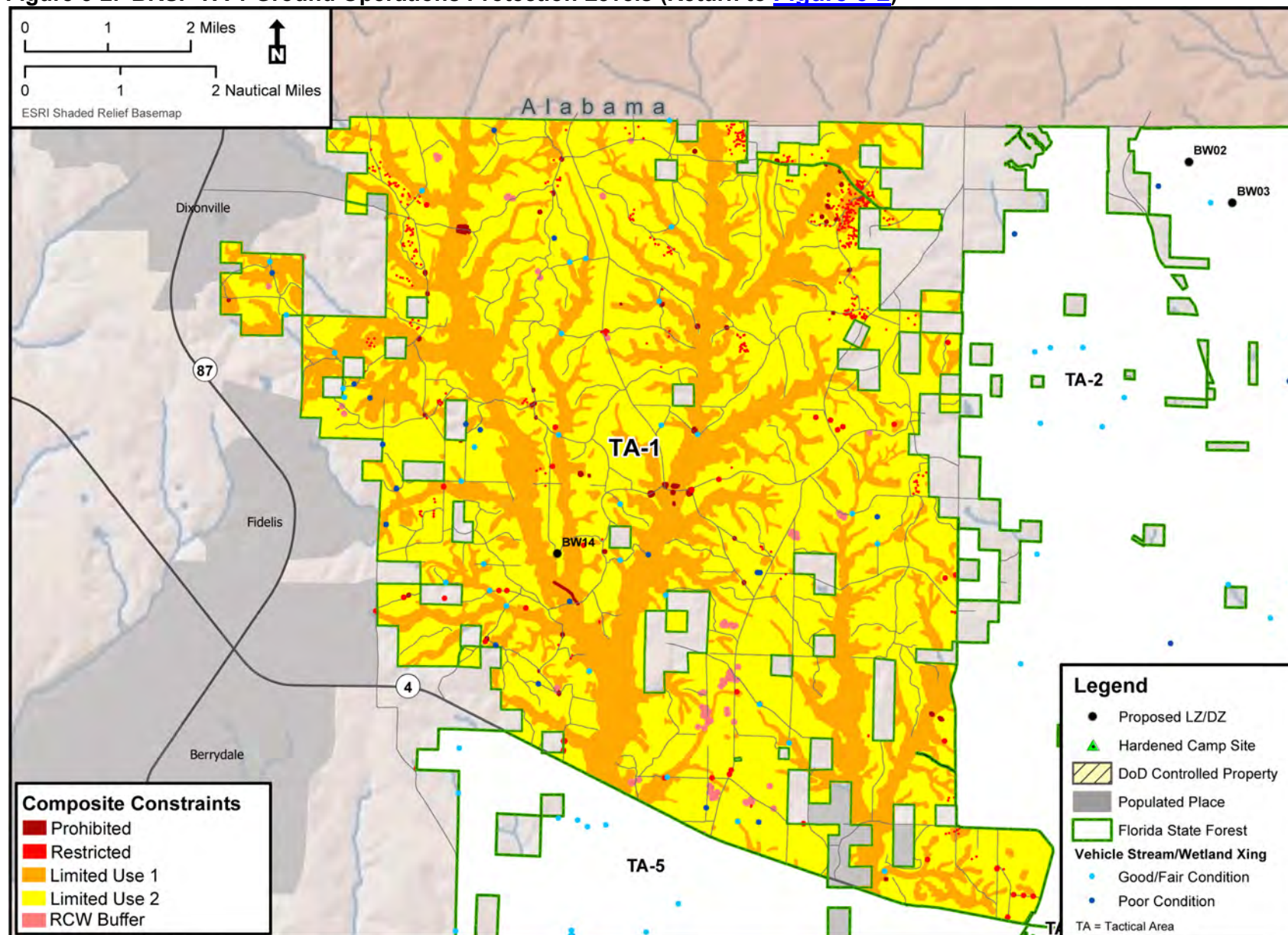


Figure 5-3. BRSF TA-2 Ground Operations Protection Levels (Return to [Figure 5-3](#))

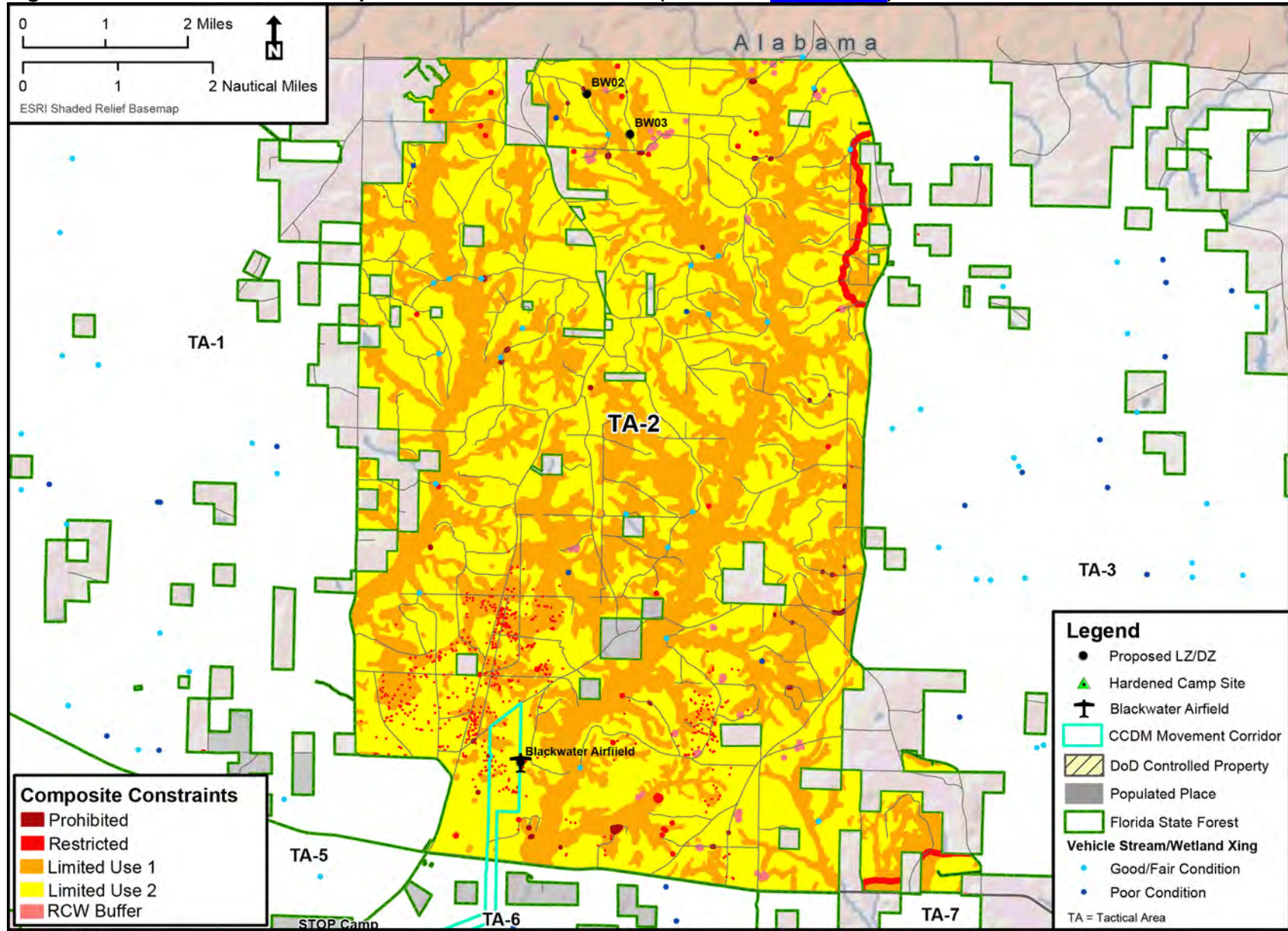




Figure 5-4. BRSF TA-3 Ground Operations Protection Levels (Return to [Figure 5-4](#))

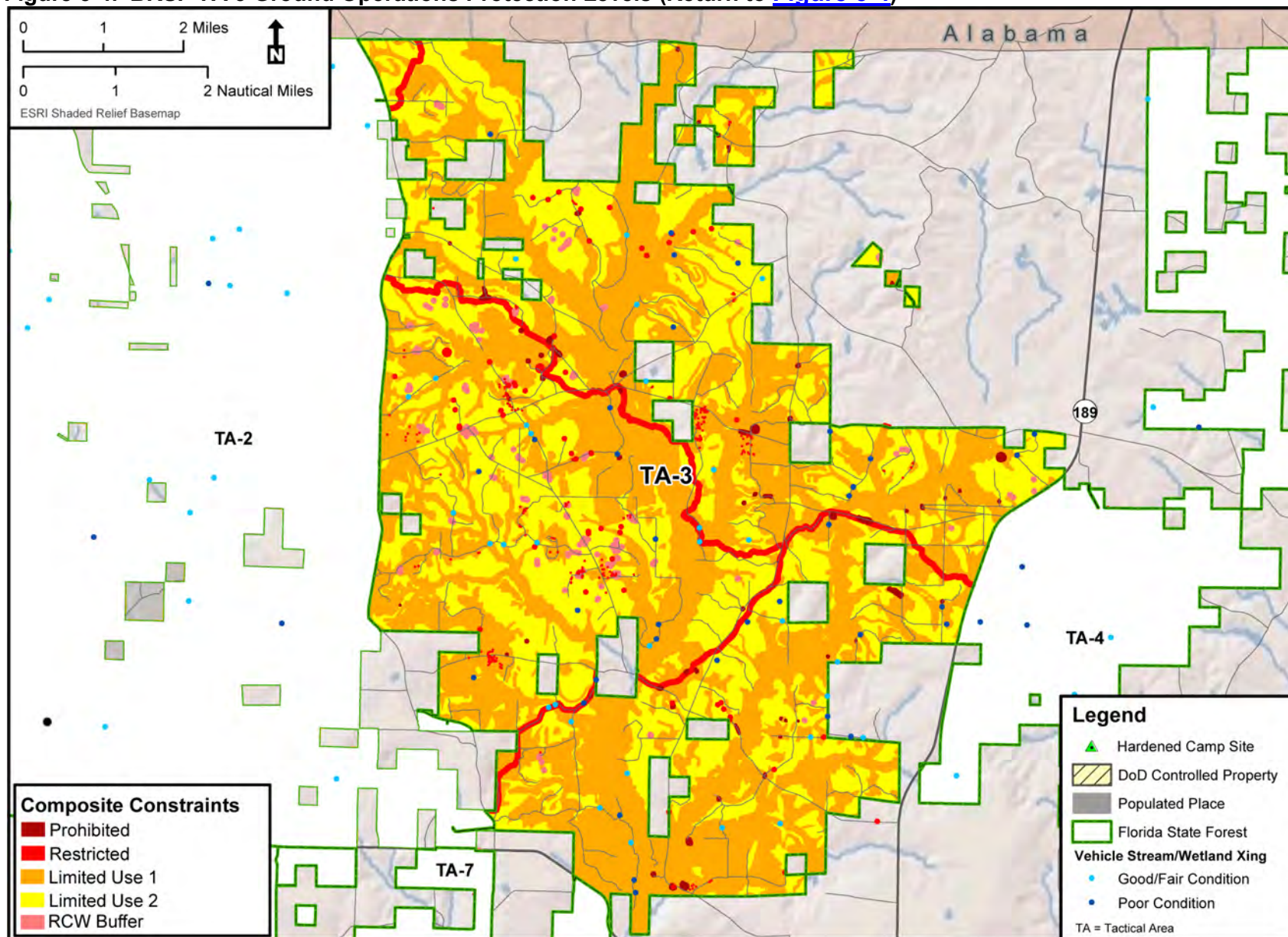


Figure 5-5. BRSF TA-4 Ground Operations Protection Levels (Return to [Figure 5-5](#))

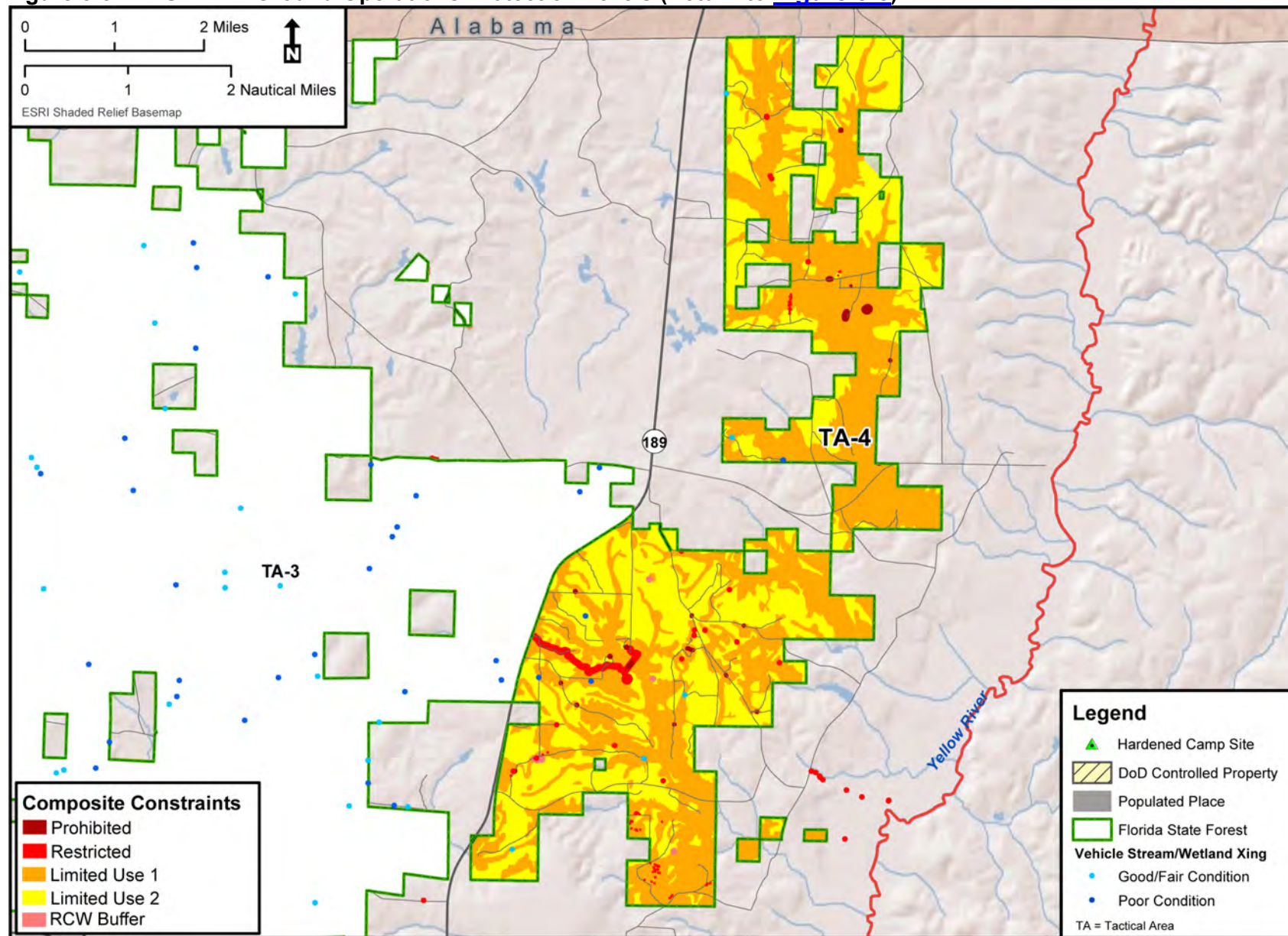




Figure 5-6. BRSF TA-5 Ground Operations Protection Levels (Return to [Figure 5-6](#))

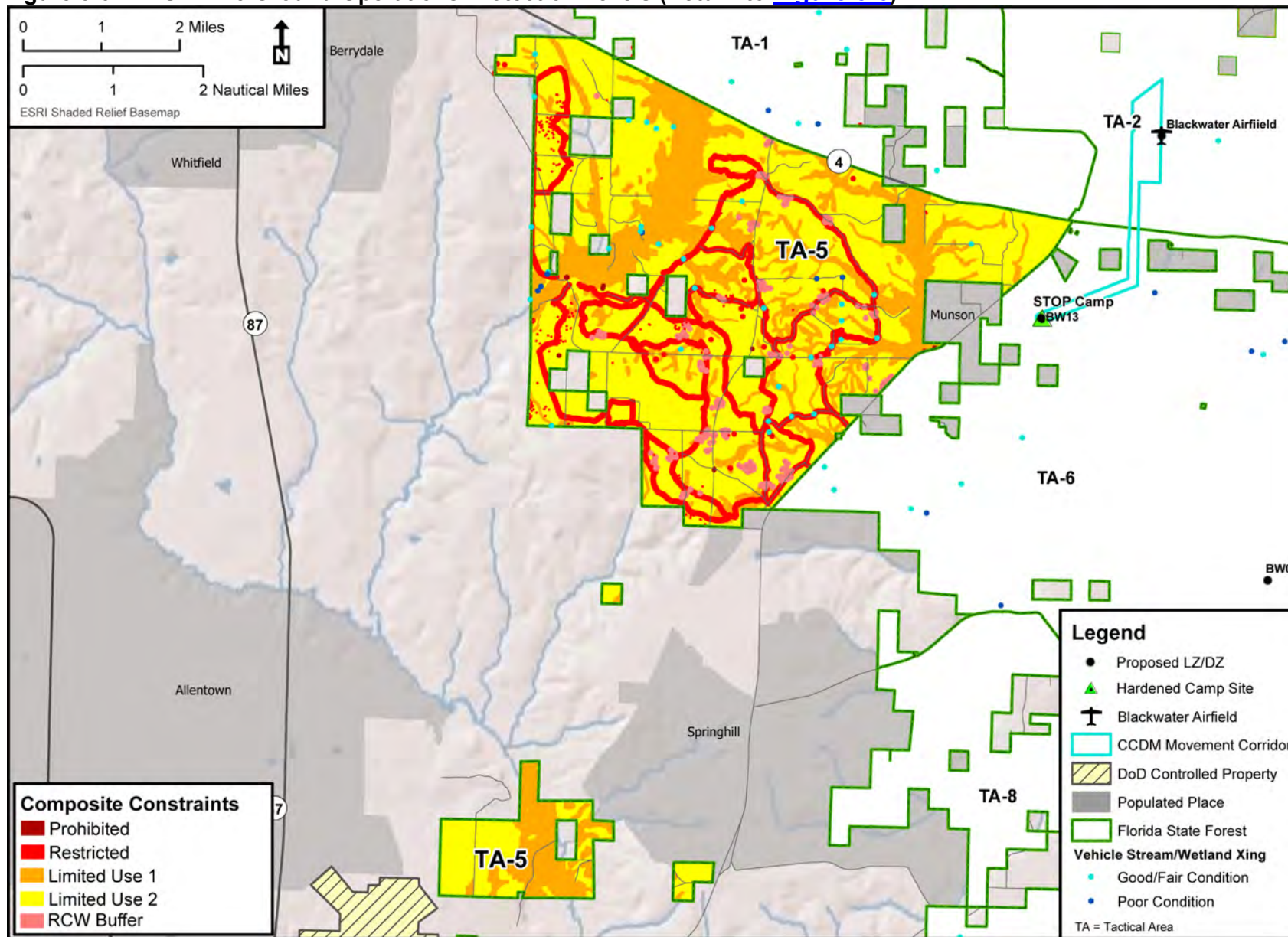




Figure 5-7. BRSF TA-6 Ground Operations Protection Levels (Return to [Figure 5-7](#))

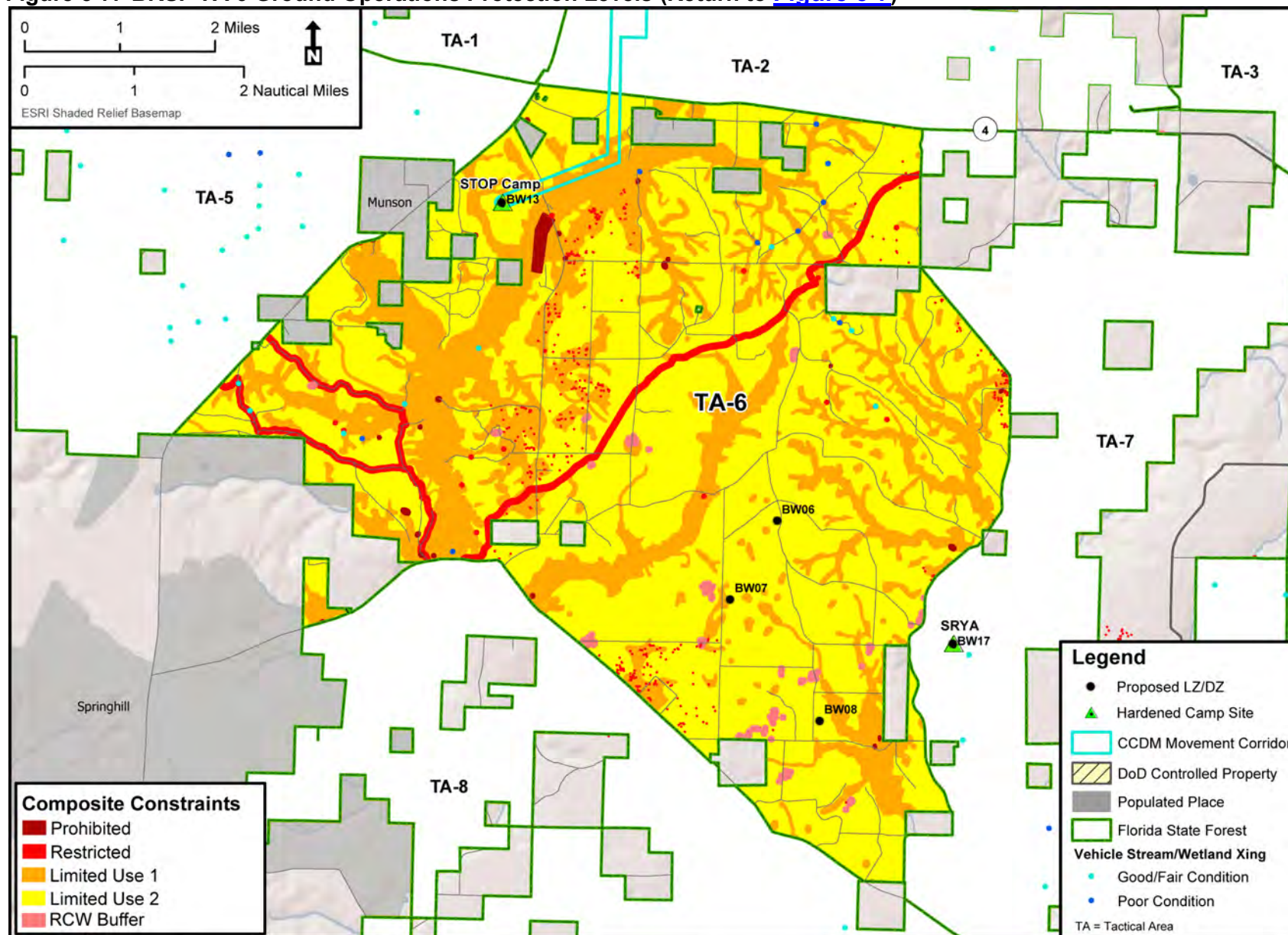


Figure 5-8. BRSF TA-7 Ground Operations Protection Levels (Return to [Figure 5-8](#))

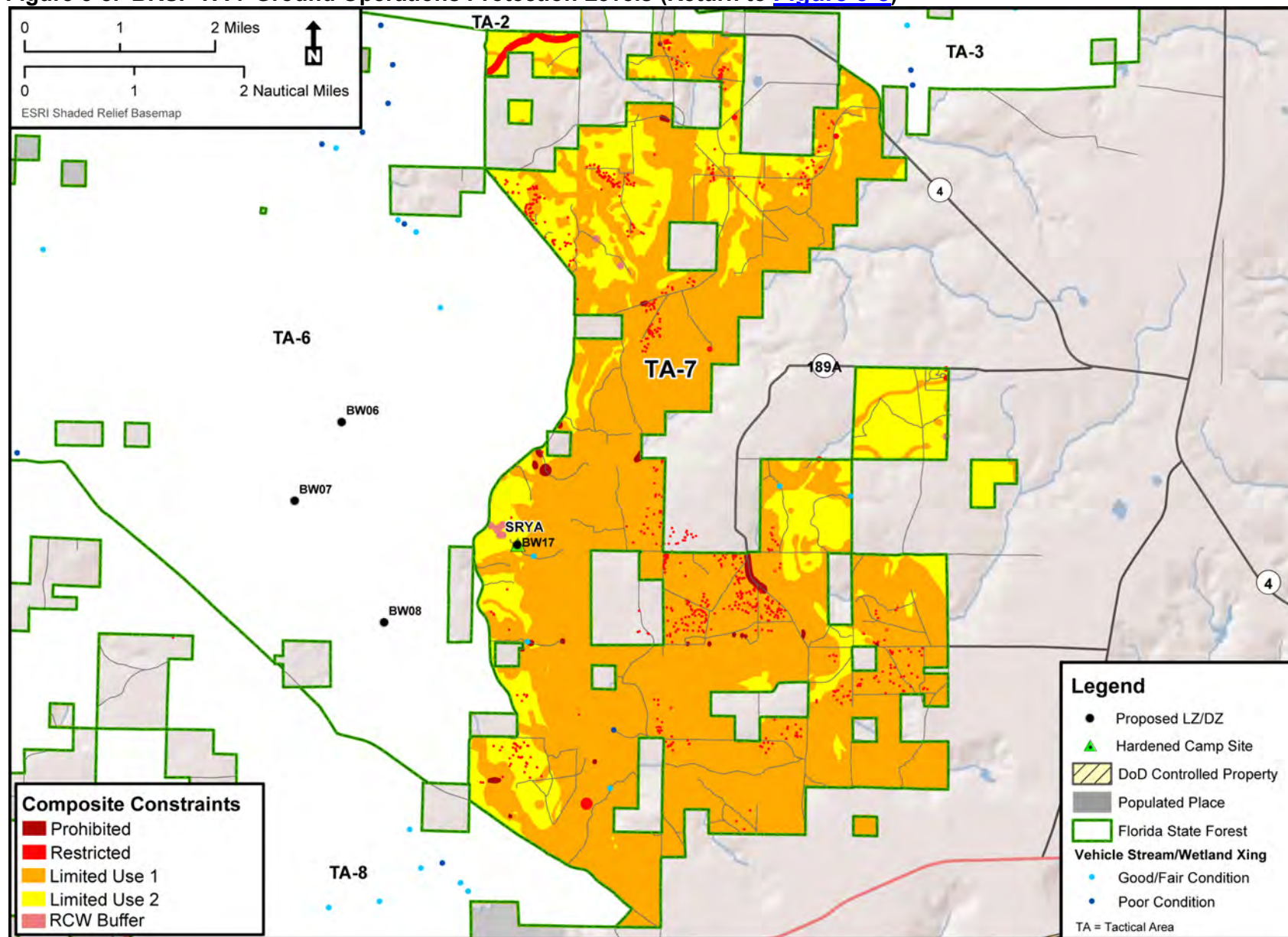




Figure 5-9. BRSF TA-8 Ground Operations Protection Levels (Return to [Figure 5-9](#))

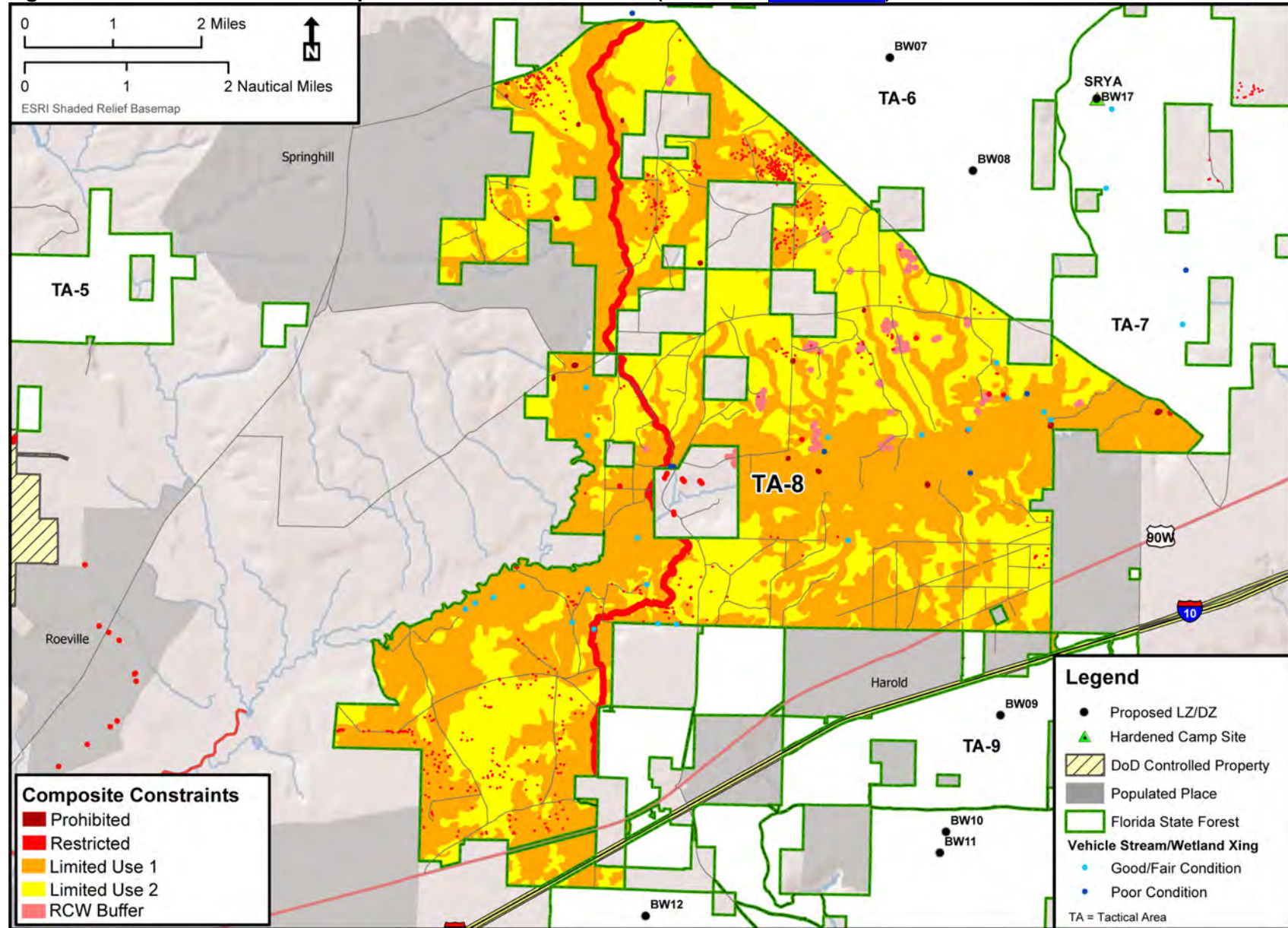




Figure 5-10. BRSF TA-9 Ground Operations Protection Levels (Return to [Figure 5-10](#))

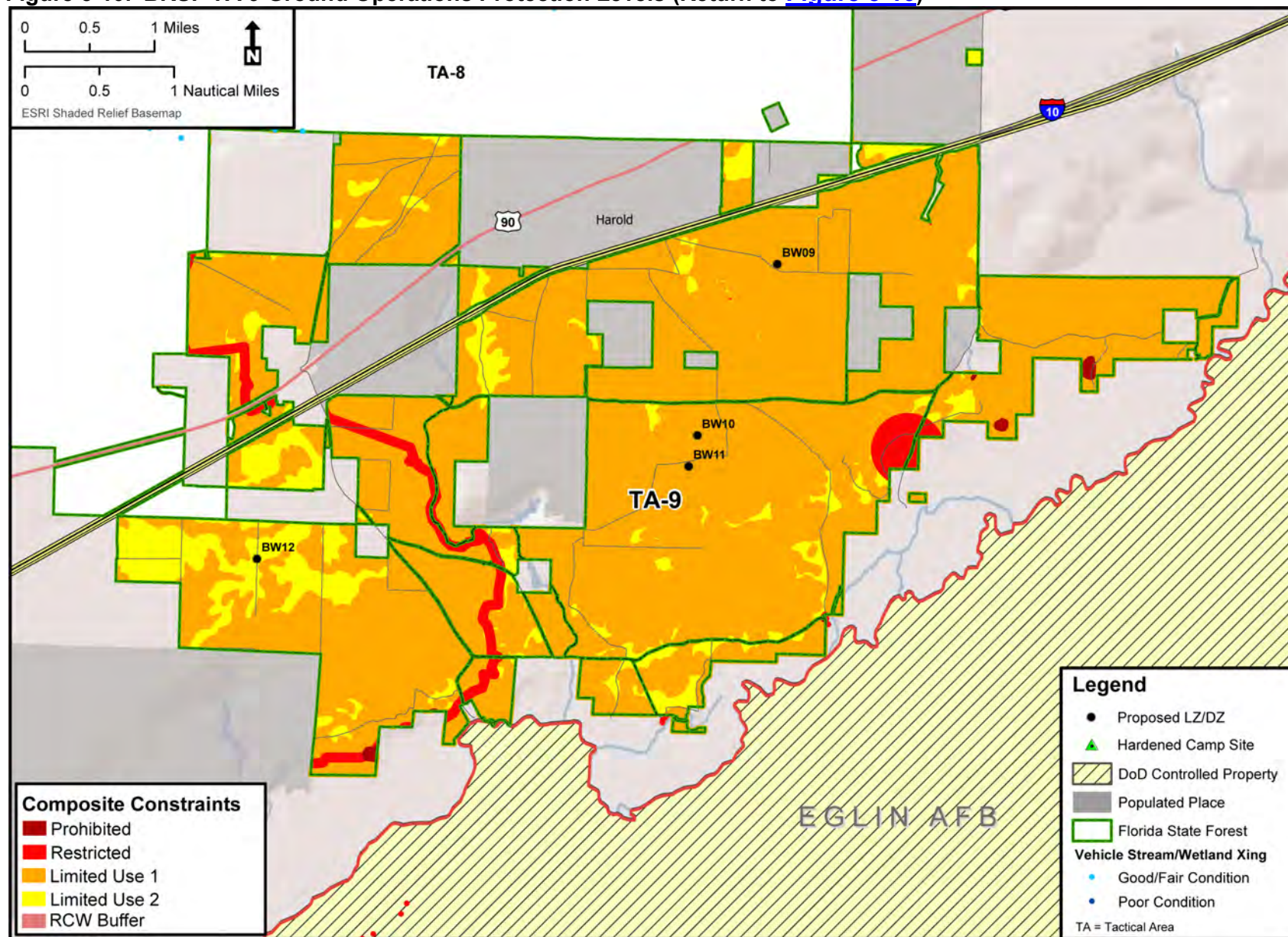




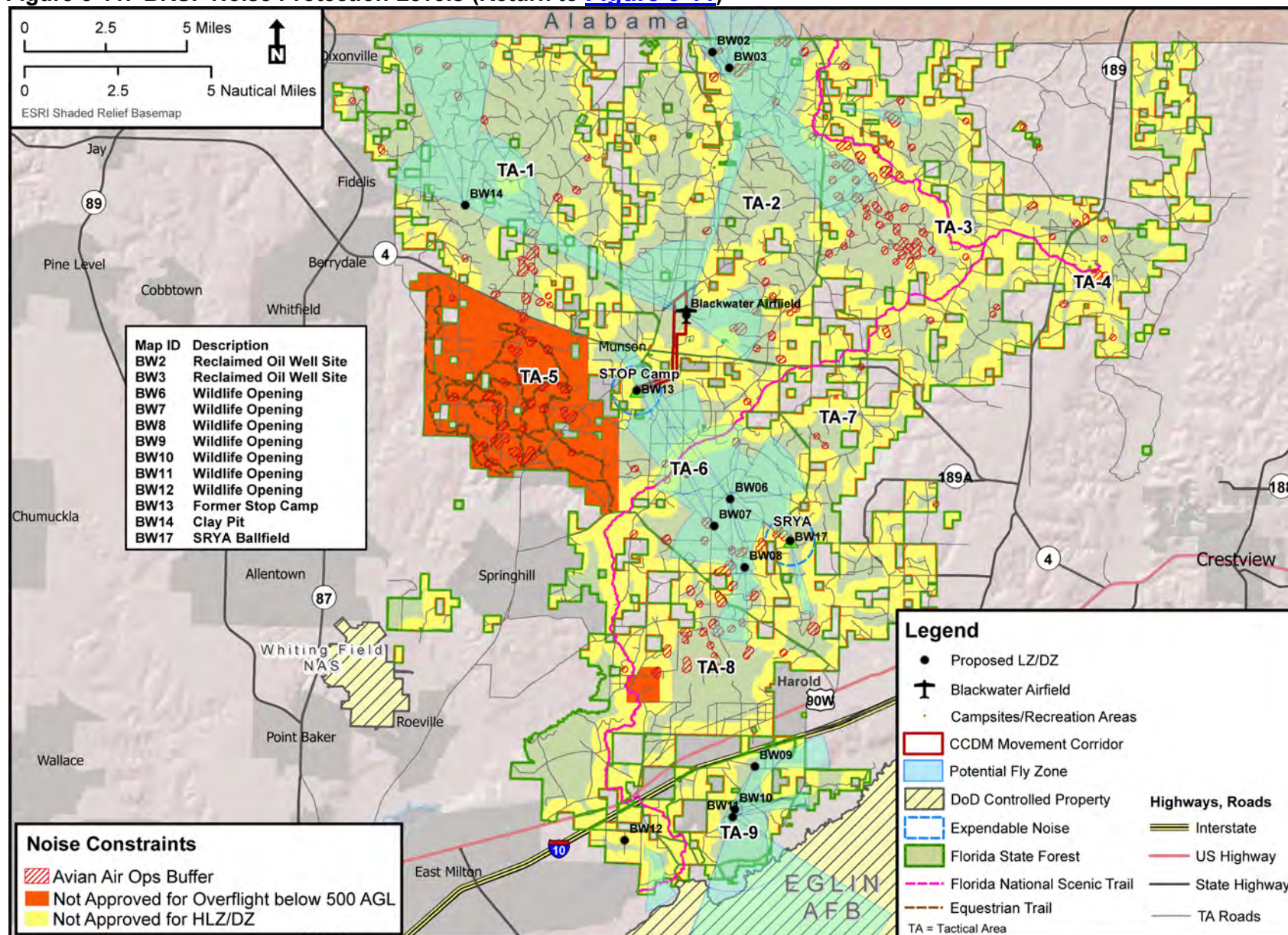
Figure 5-11. BRSF Noise Protection Levels (Return to [Figure 5-11](#))



Figure 5-12. BRSF TA-1 Noise Protection Levels (Return to [Figure 5-12](#))

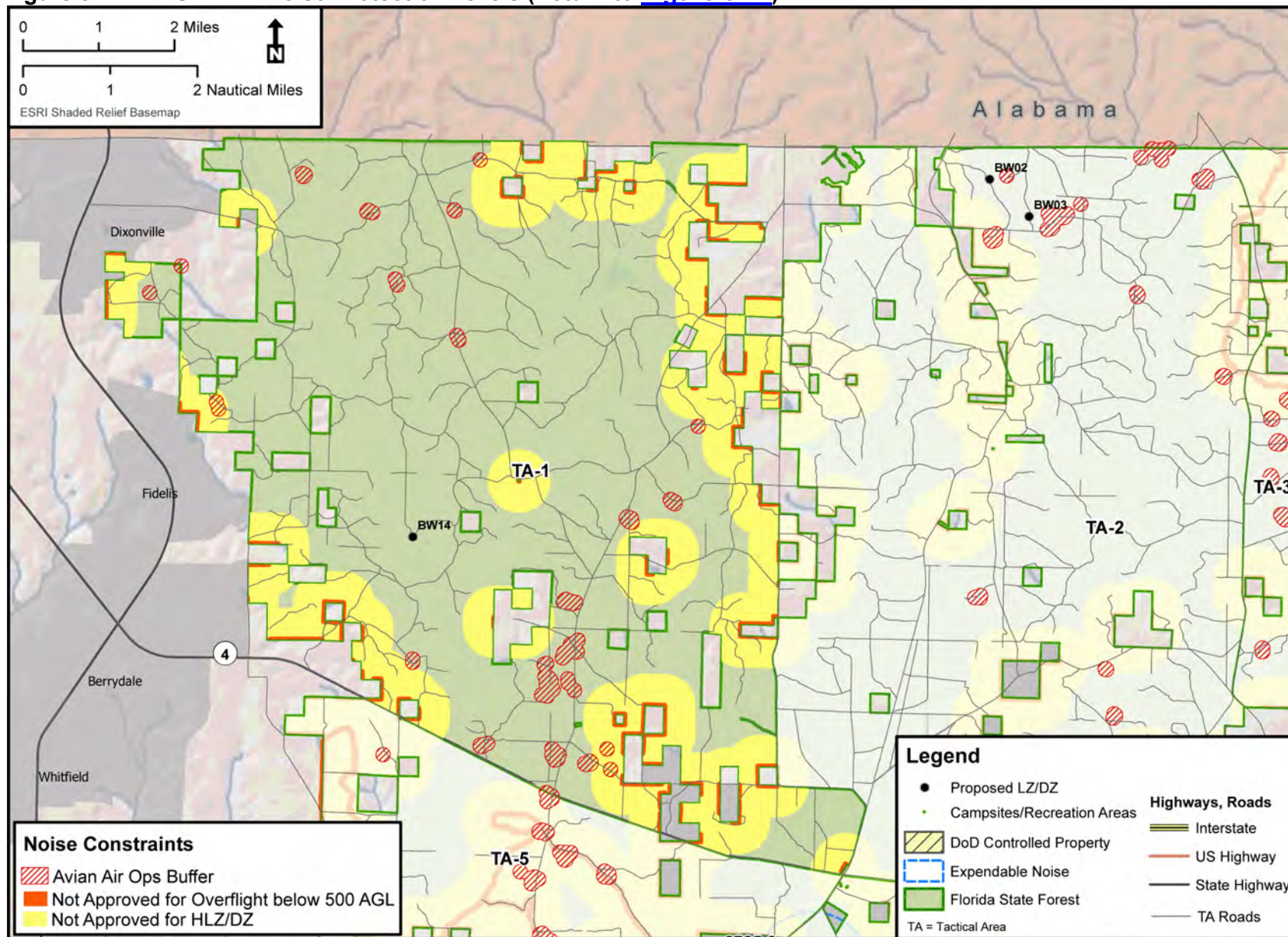




Figure 5-13. BRSF TA-2 Noise Protection Levels (Return to [Figure 5-13](#))

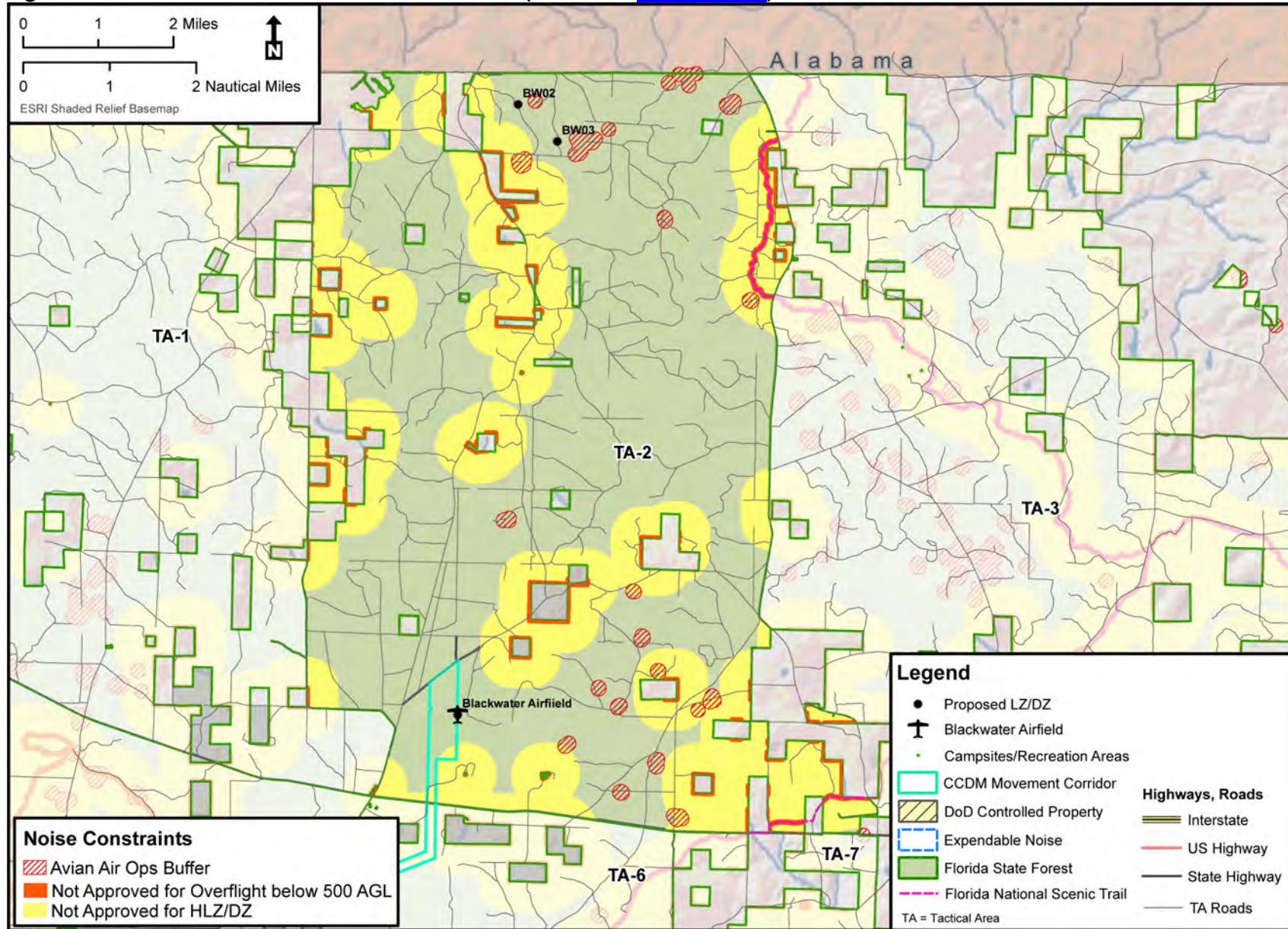




Figure 5-14. BRSF TA-3 Noise Protection Levels (Return to [Figure 5-14](#))

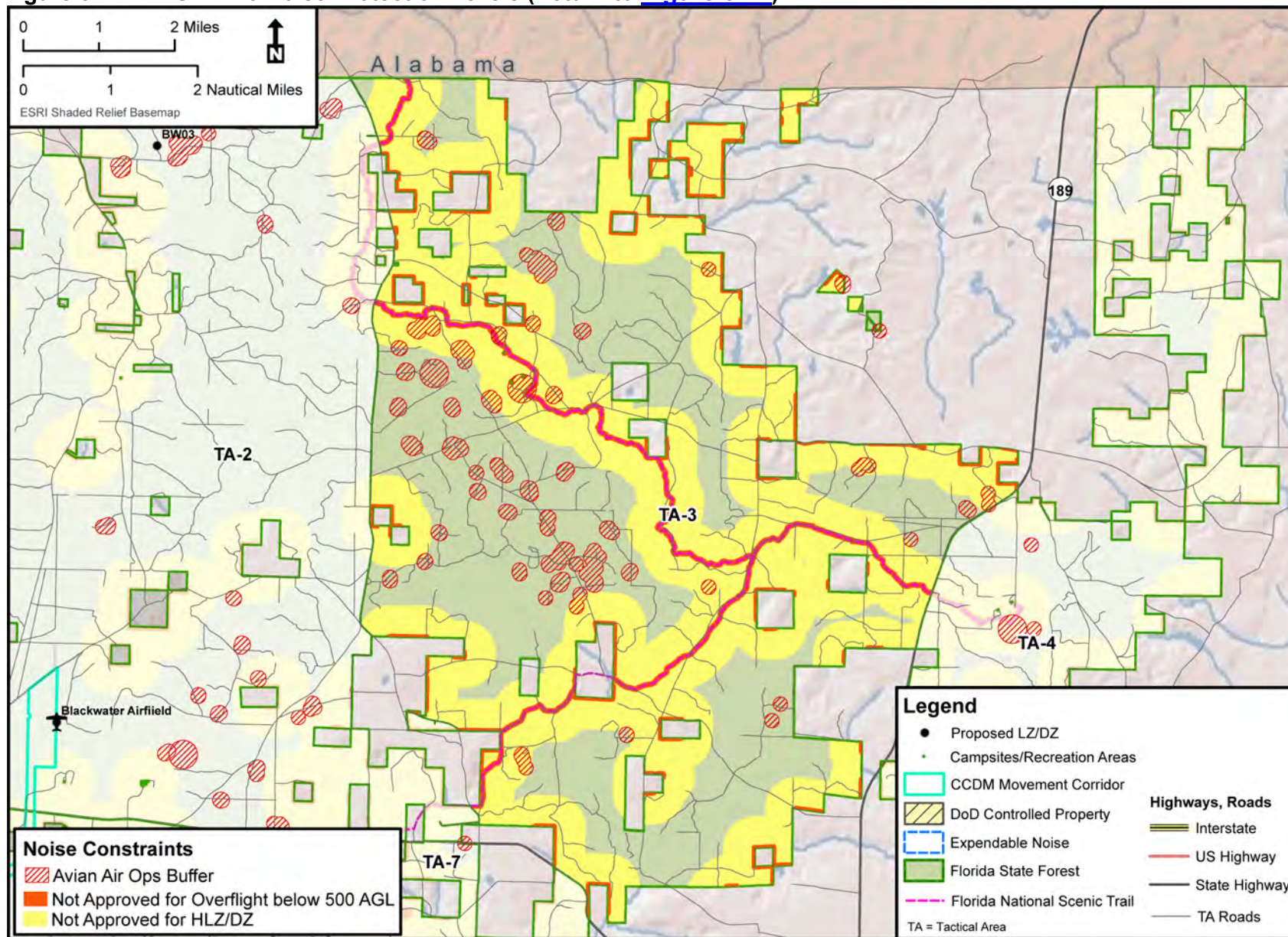




Figure 5-15. BRSF TA-4 Noise Protection Levels (Return to [Figure 5-15](#))

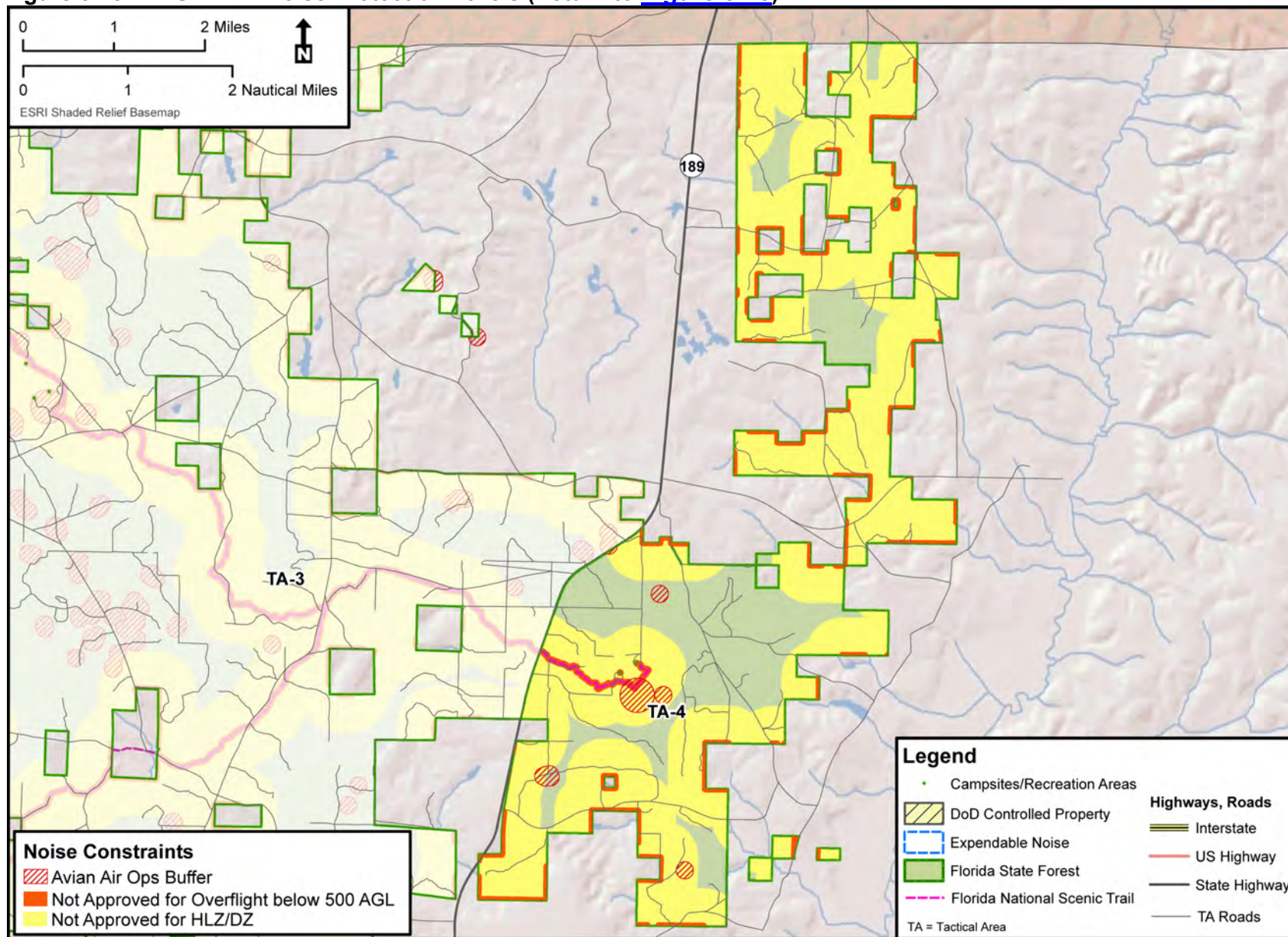


Figure 5-16. BRSF TA-5 Noise Protection Levels (Return to [Figure 5-16](#))

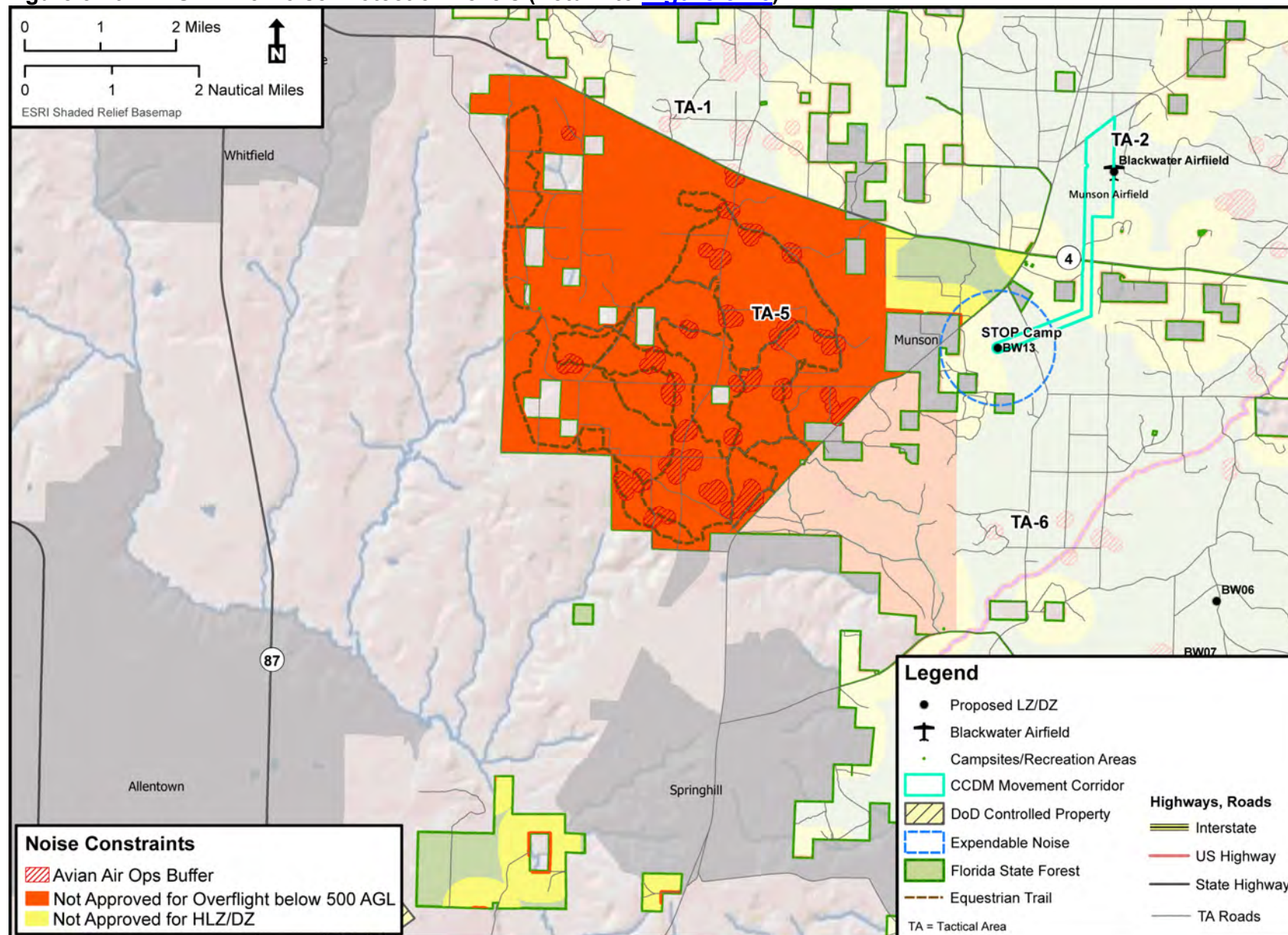




Figure 5-17. BRSF TA-6 Noise Protection Levels (Return to [Figure 5-17](#))

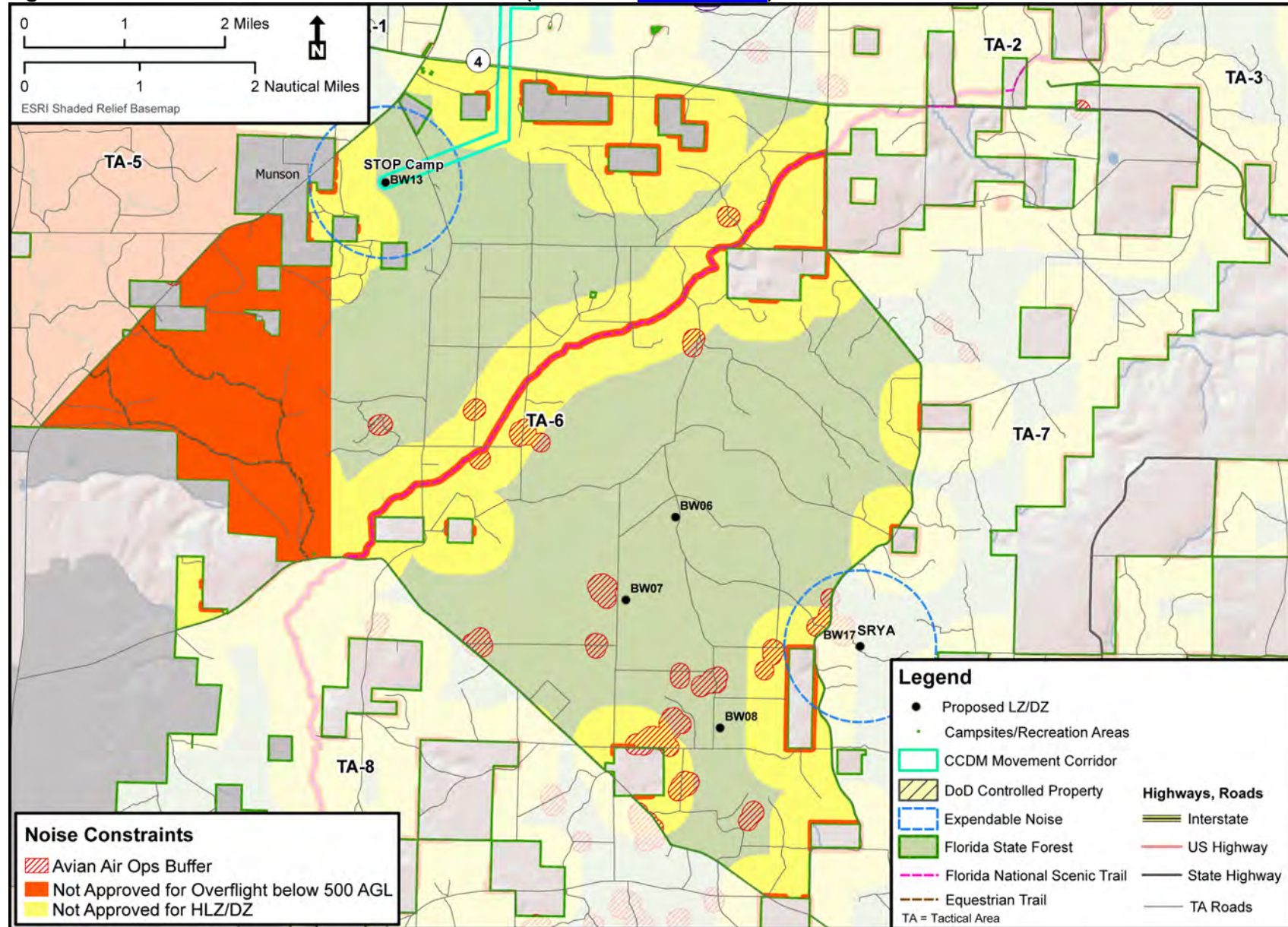




Figure 5-18. BRSF TA-7 Noise Protection Levels (Return to [Figure 5-18](#))

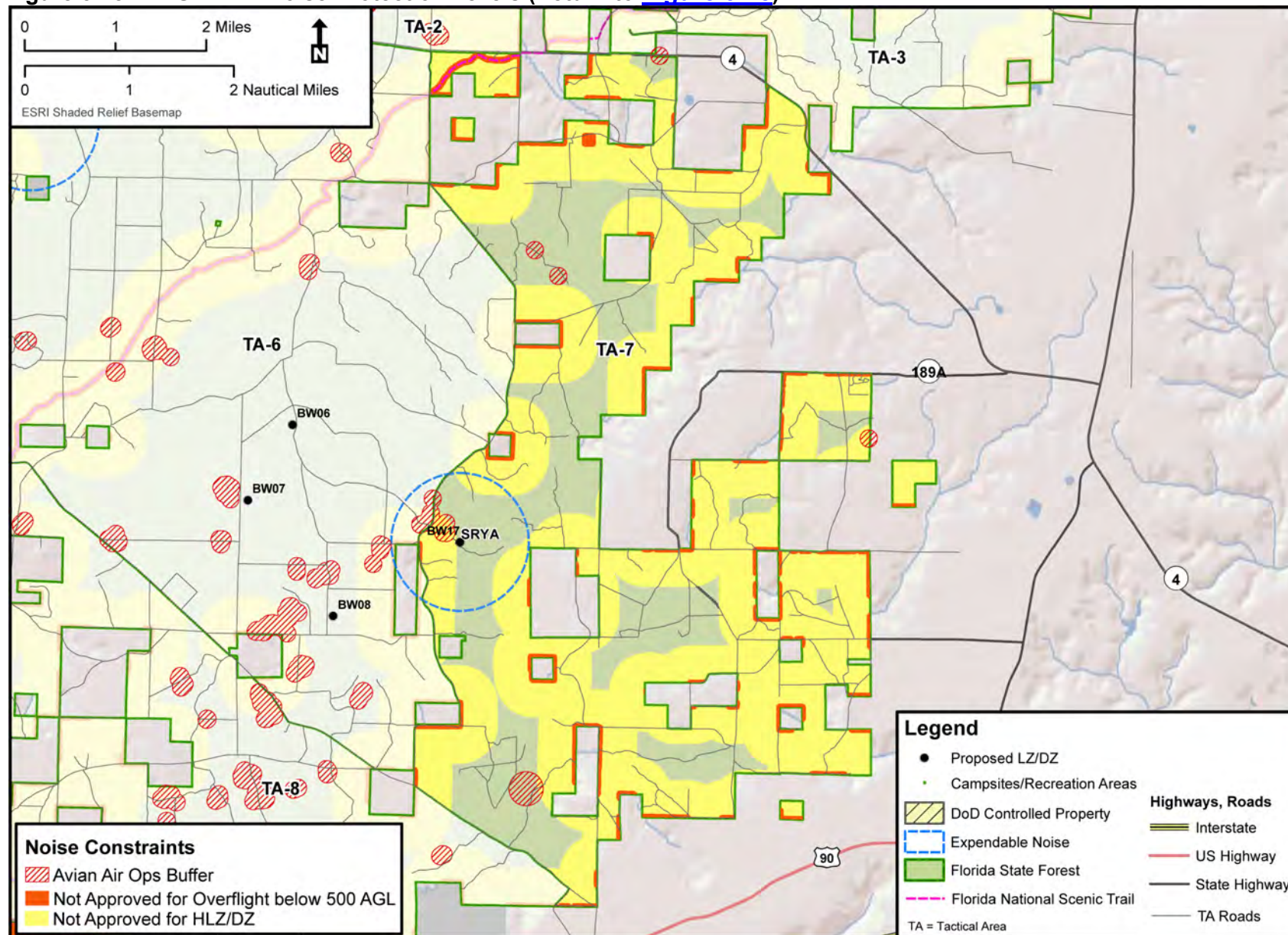




Figure 5-19. BRSF TA-8 Noise Protection Levels (Return to [Figure 5-19](#))

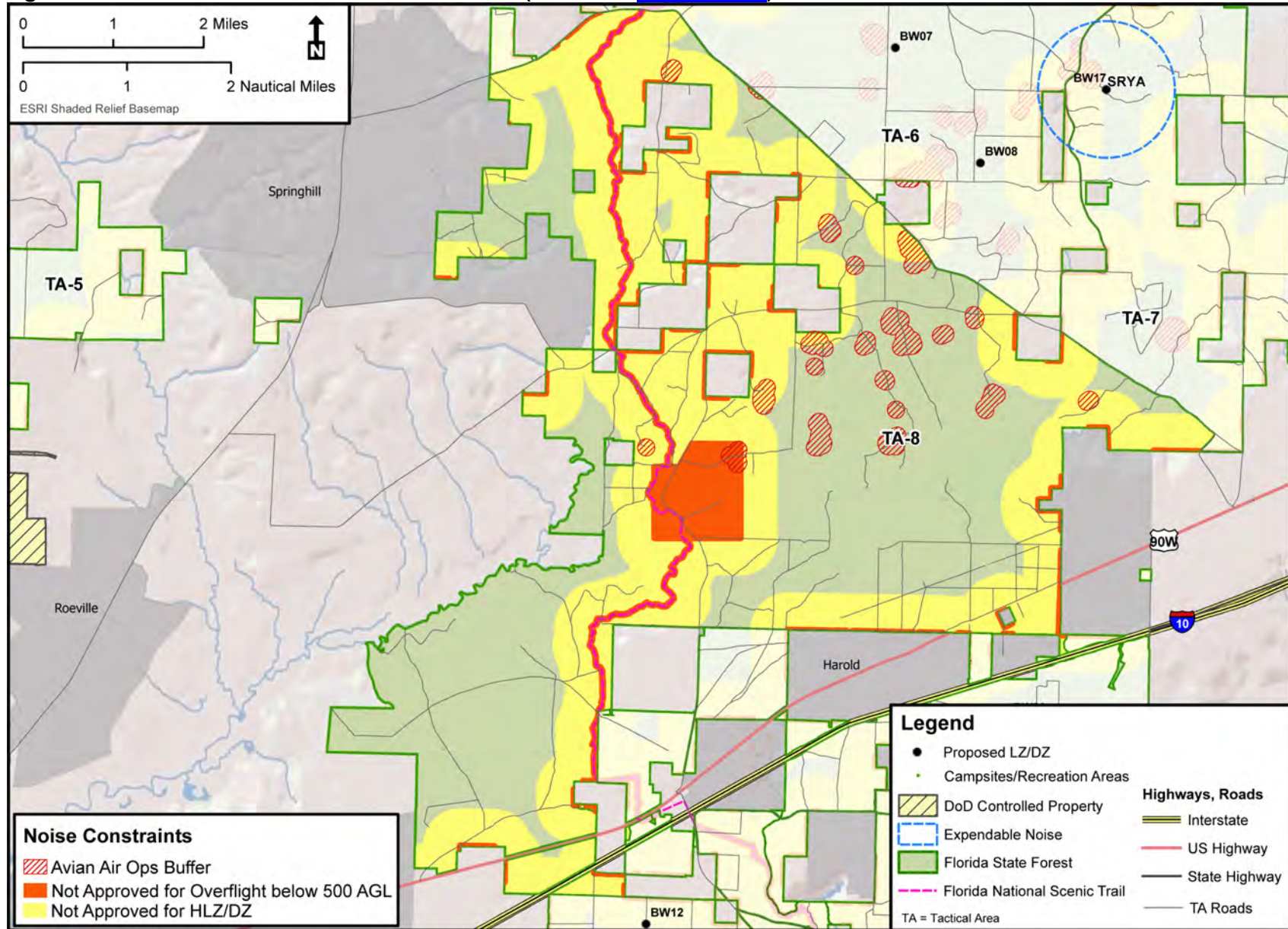
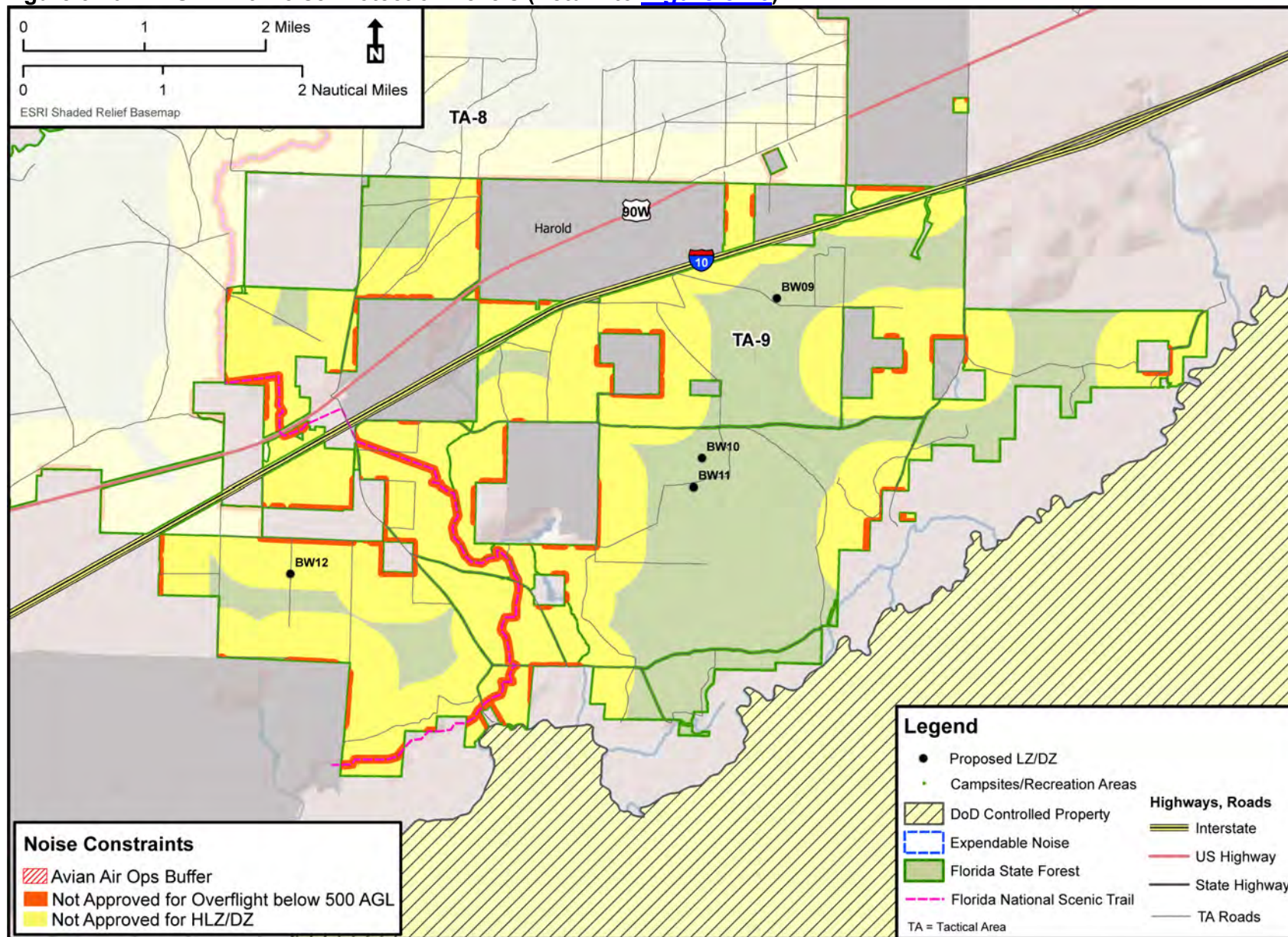




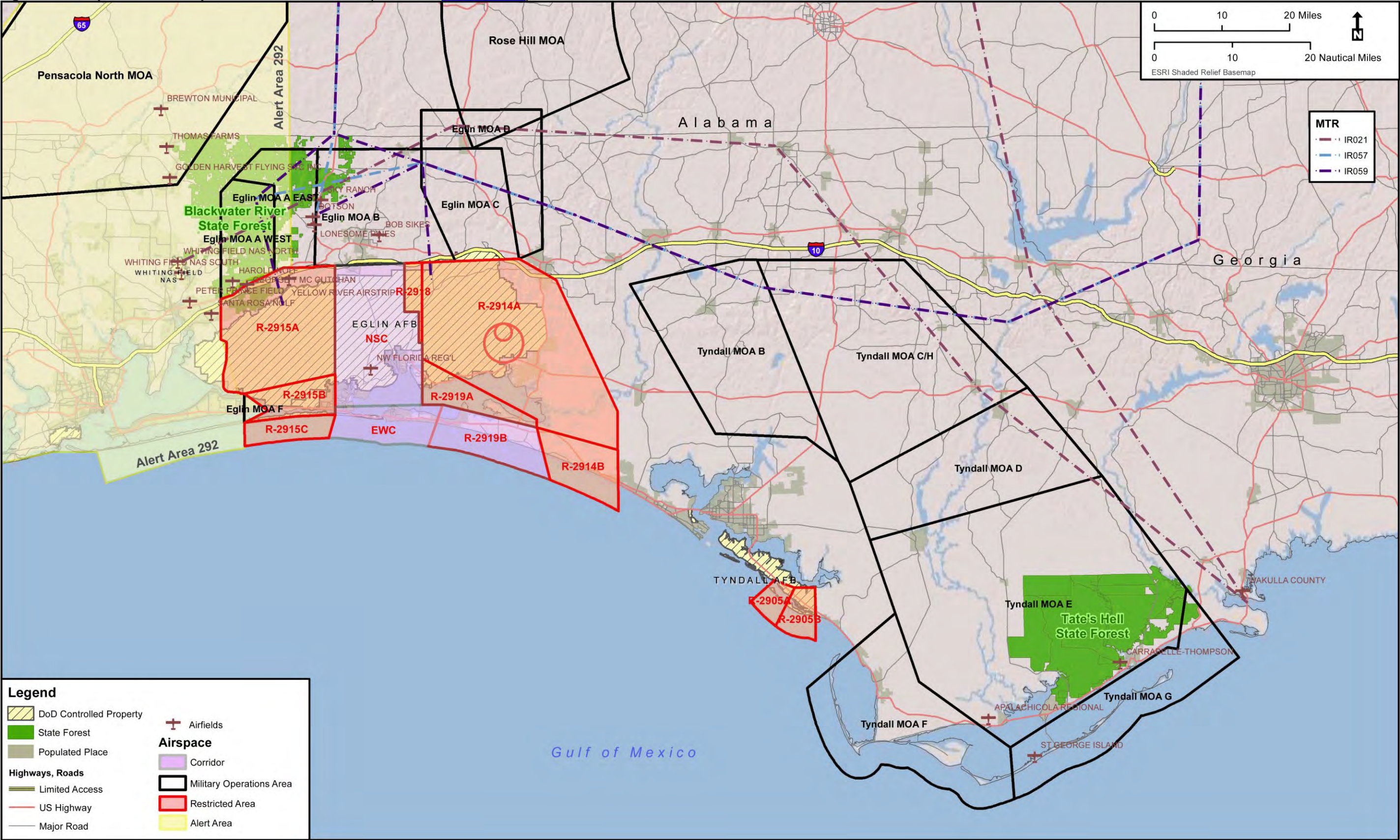
Figure 5-20. BRSF TA-9 Noise Protection Levels (Return to [Figure 5-20](#))



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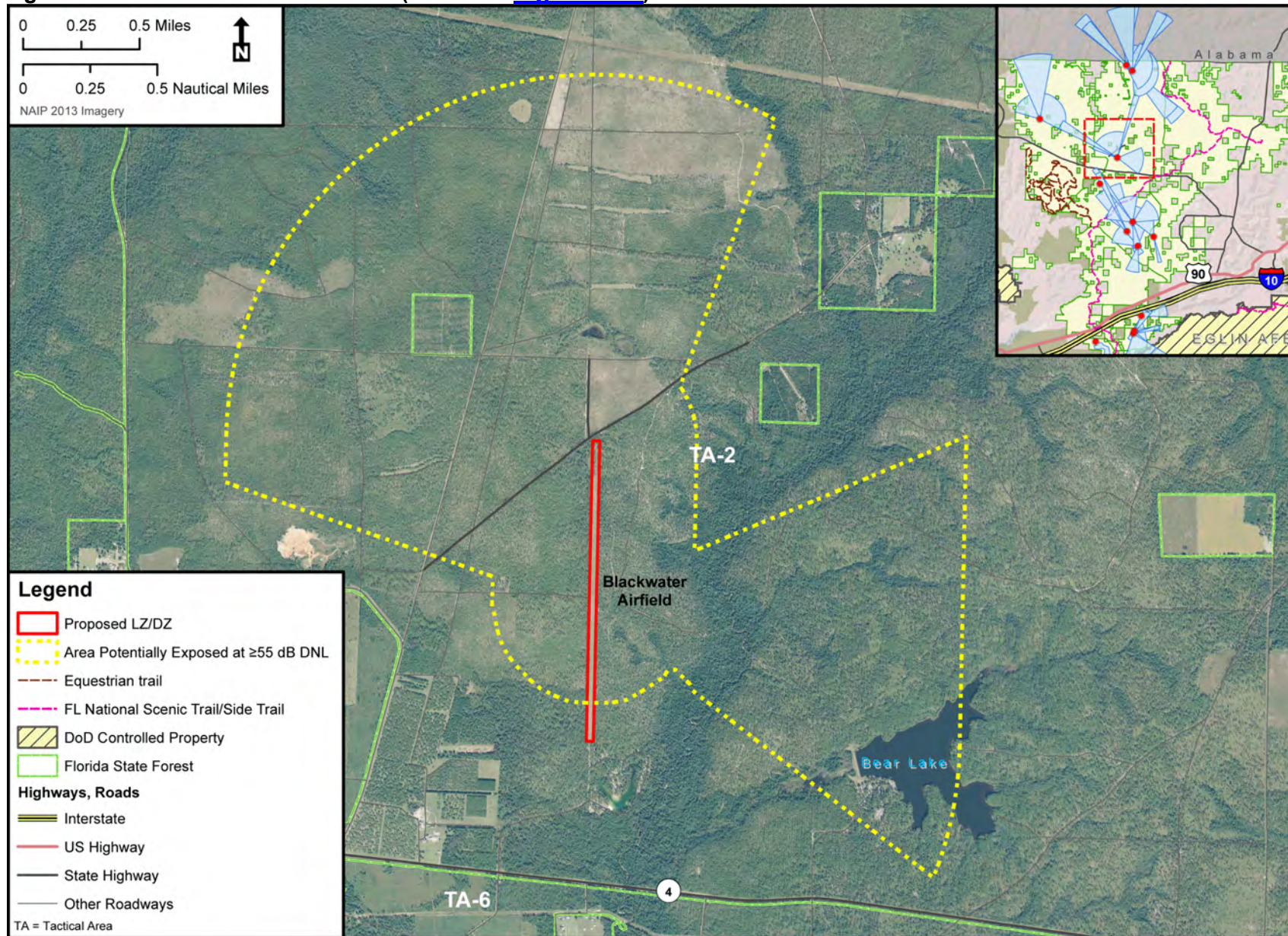
Figure 5-21. Special Use Airspace Units and Airfields (Return to [Figure 5-21](#))





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Figure 5-22. Blackwater Airfield DNL (Return to [Figure 5-22](#))





**Figure 5-23. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 2 and 3 (Return to [Figure 5-23](#))**

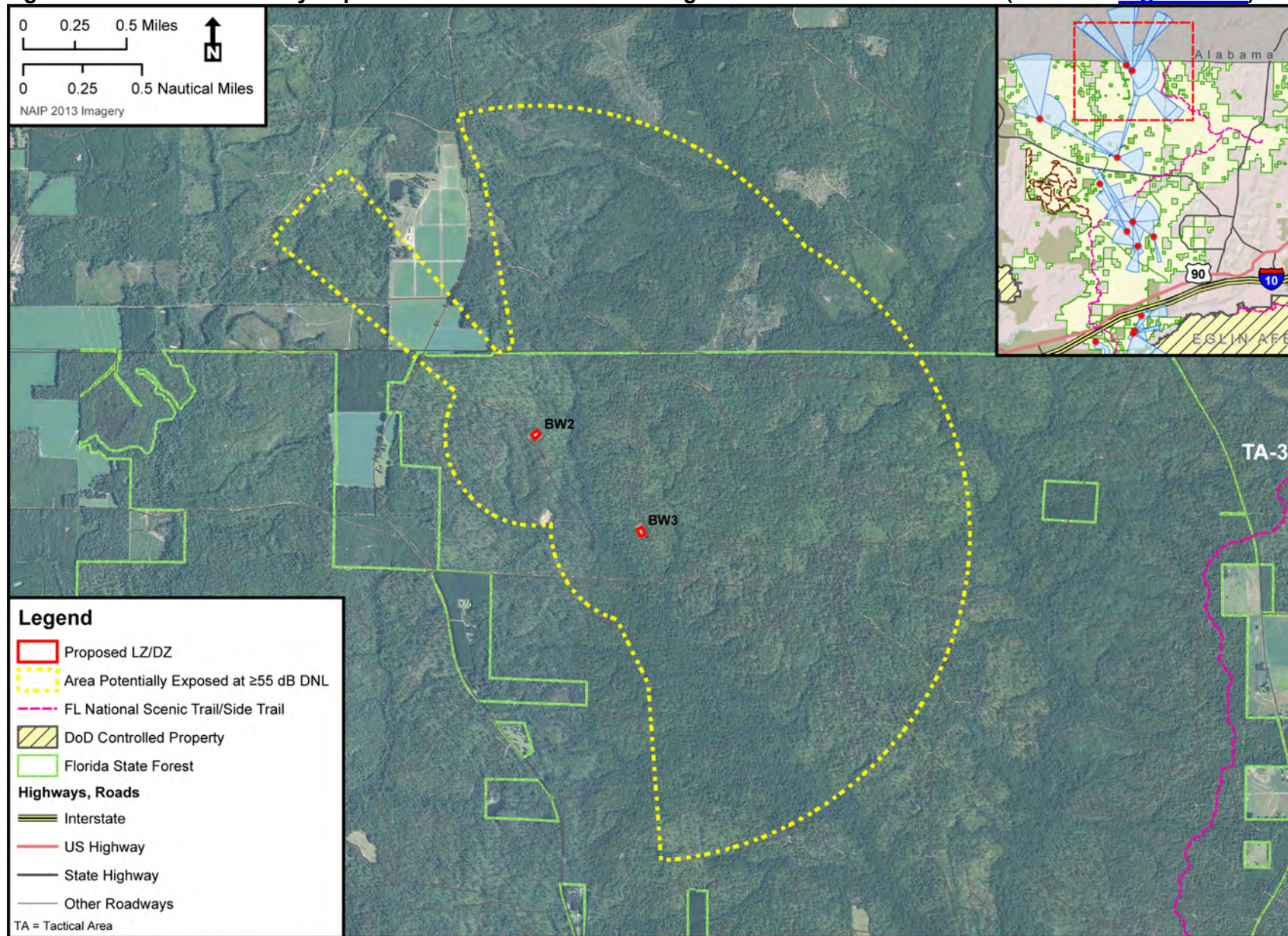
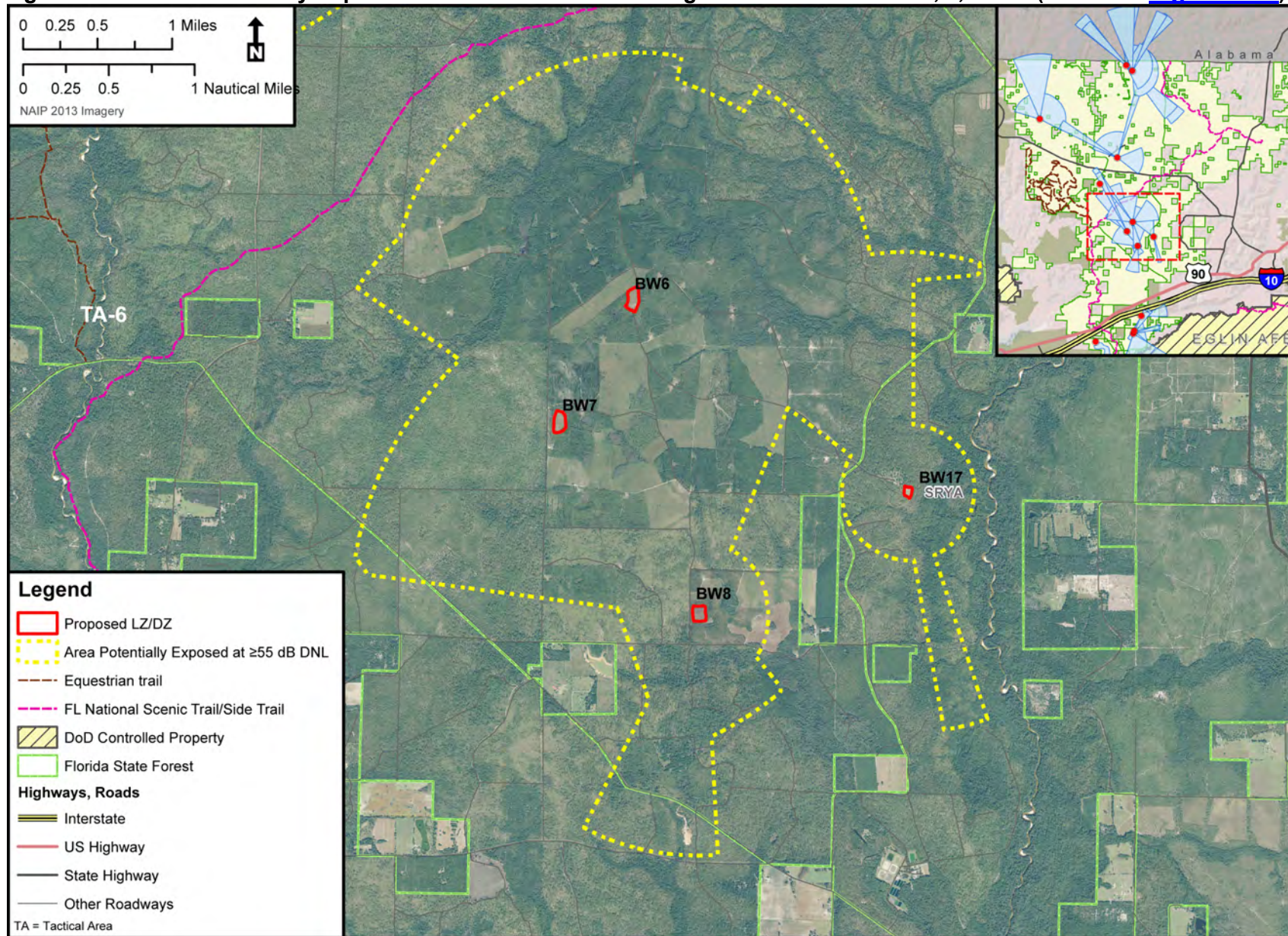




Figure 5-24. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 6, 7, and 8 (Return to [Figure 5-24](#))





**Figure 5-25. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 9, 10, and 11 (Return to [Figure 5-25](#))**

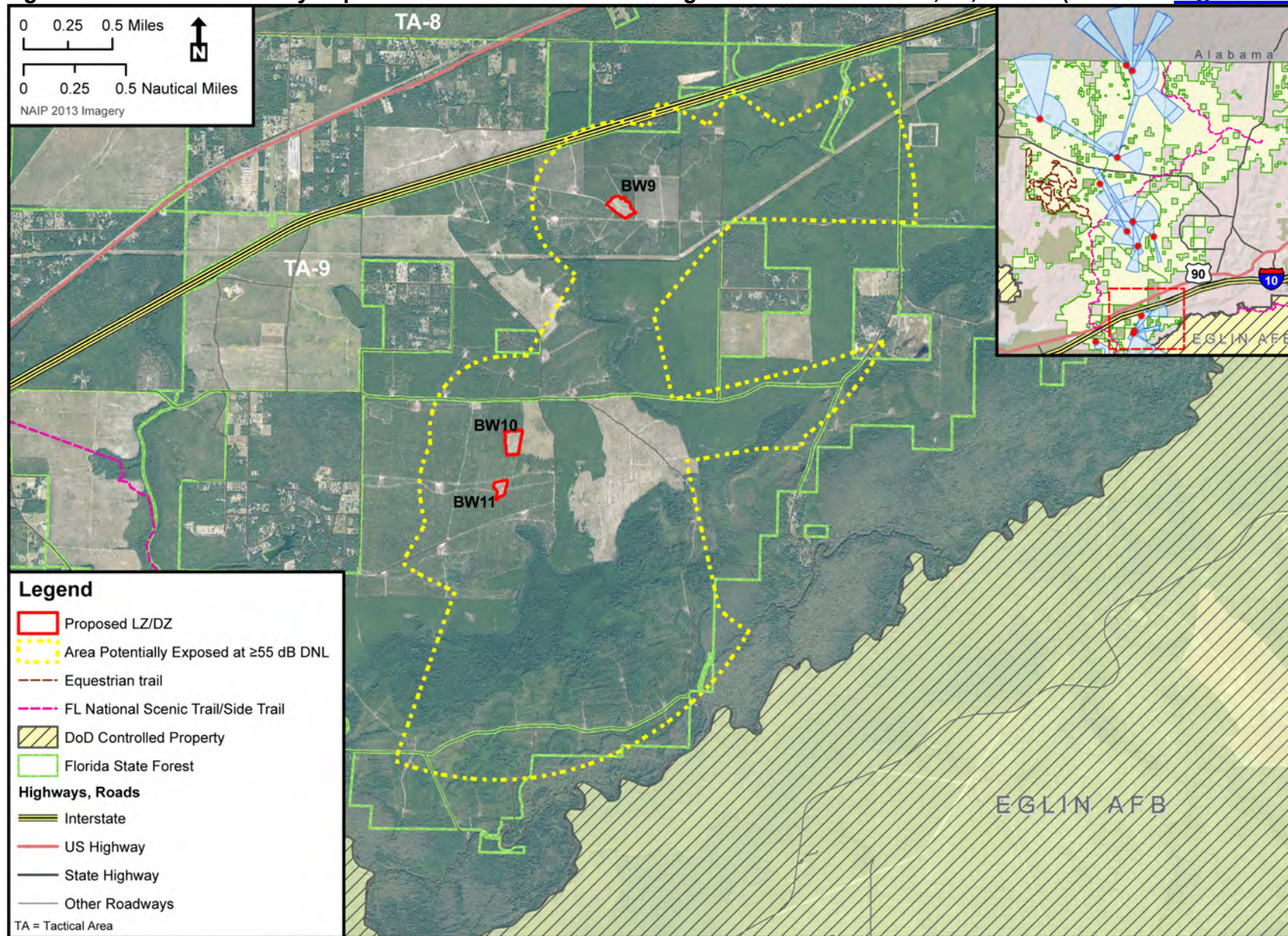
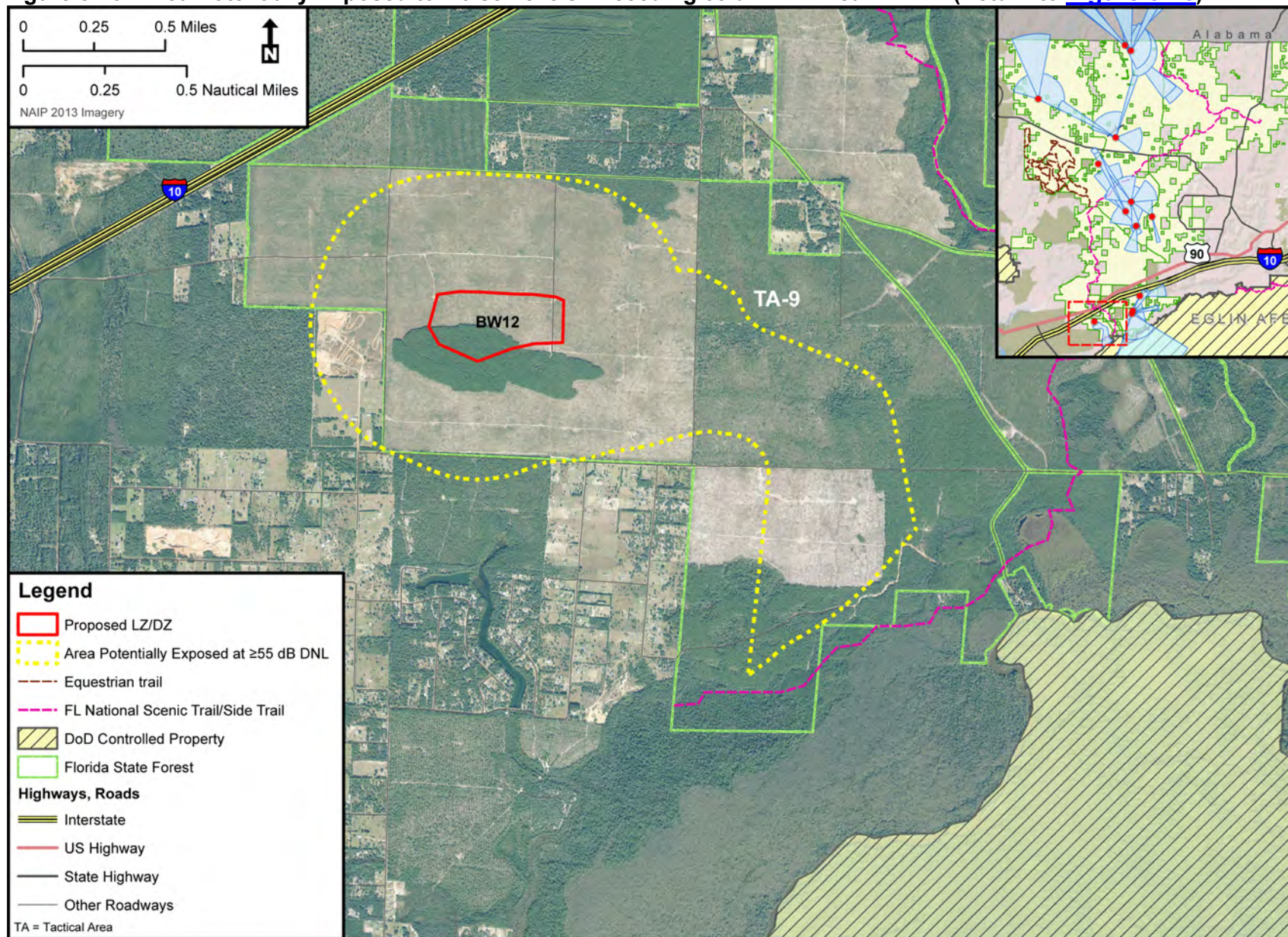




Figure 5-26. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 12 (Return to [Figure 5-26](#))





**Figure 5-27. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 13 (Return to [Figure 5-27](#))**

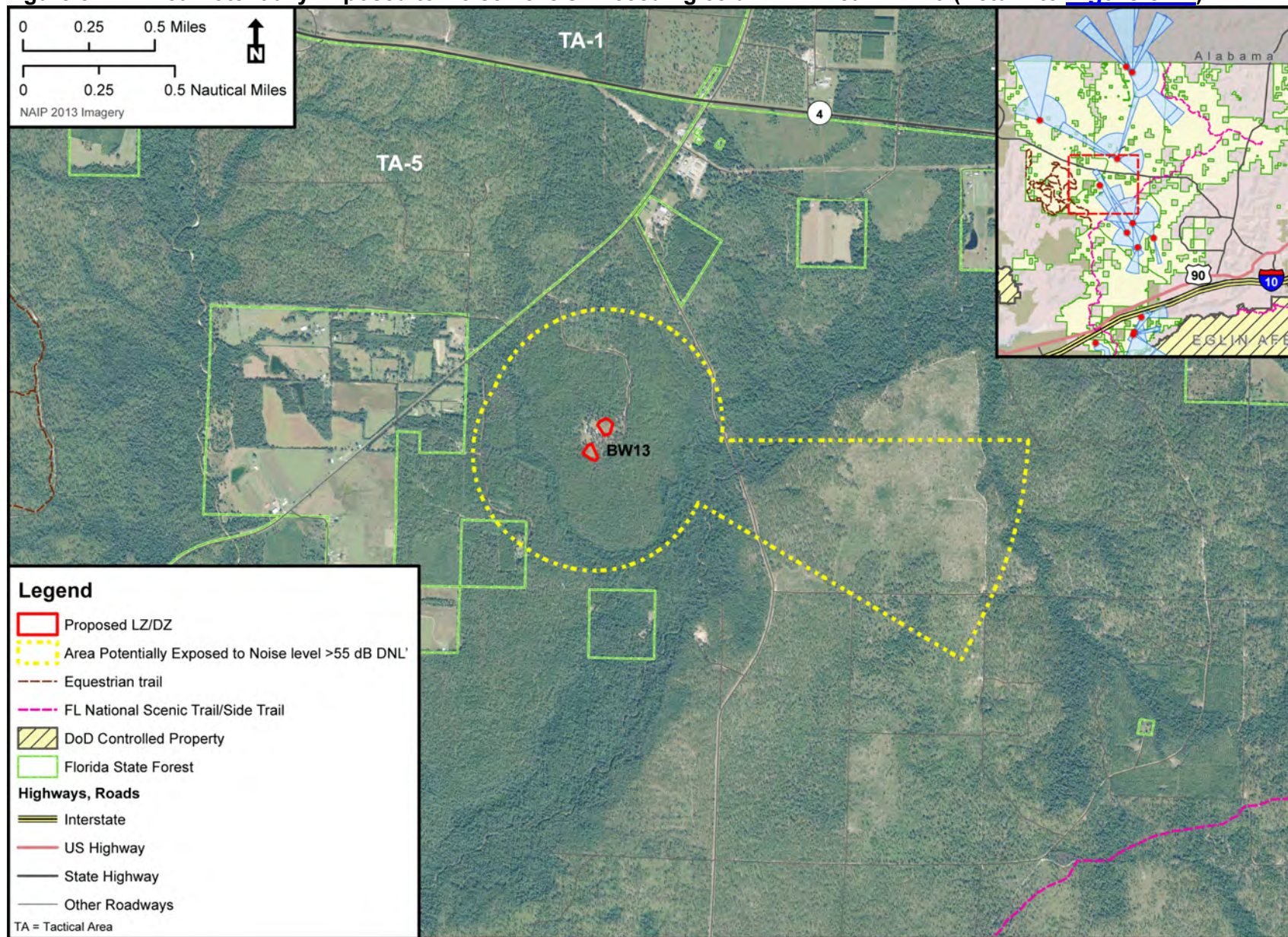




Figure 5-28. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near BW 14 (Return to [Figure 5-28](#))

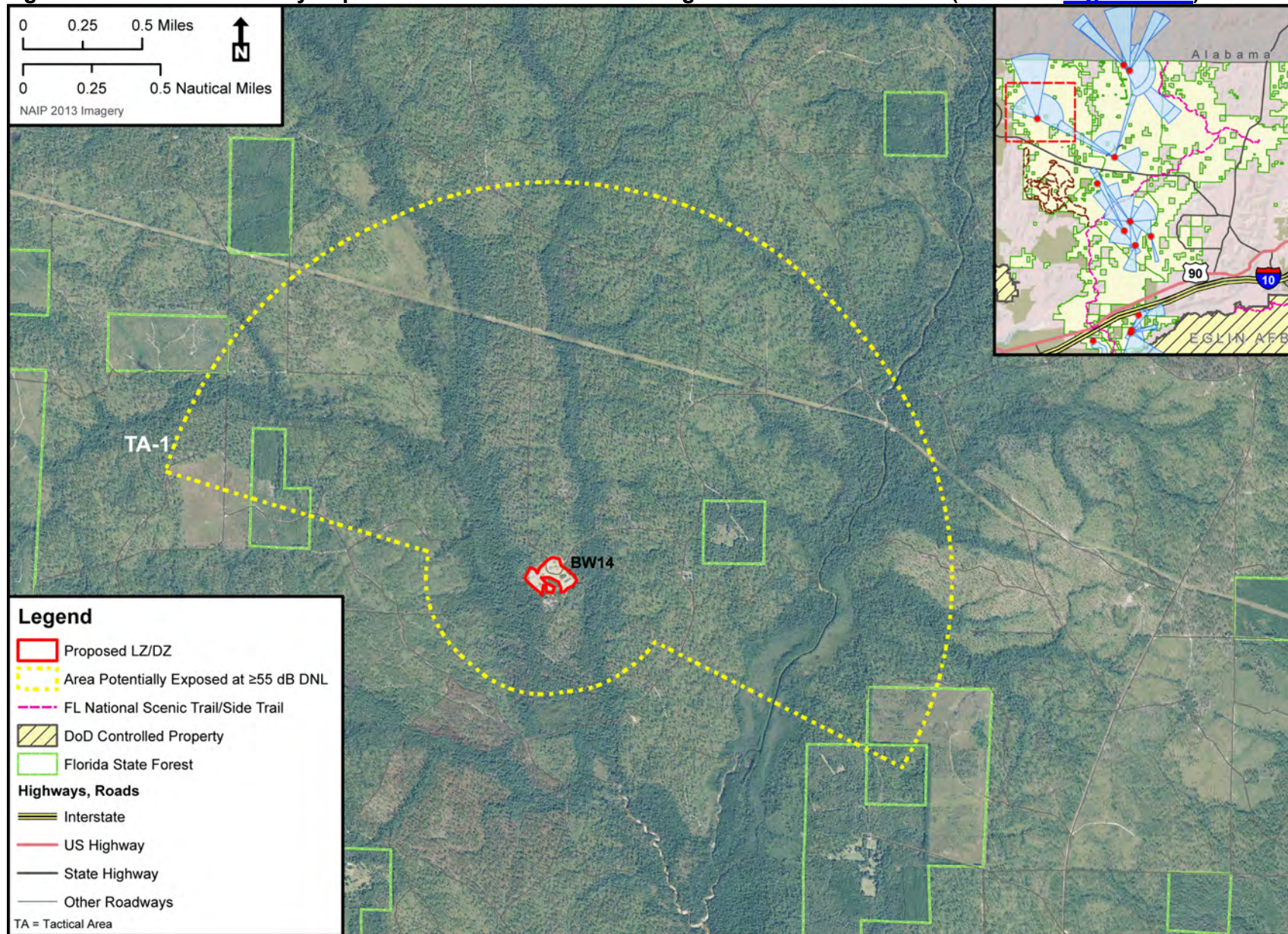




Figure 5-29. Area Exposed to Elevated Large-Arms and Small-Arms Munitions Noise (Return to [Figure 5-29](#))

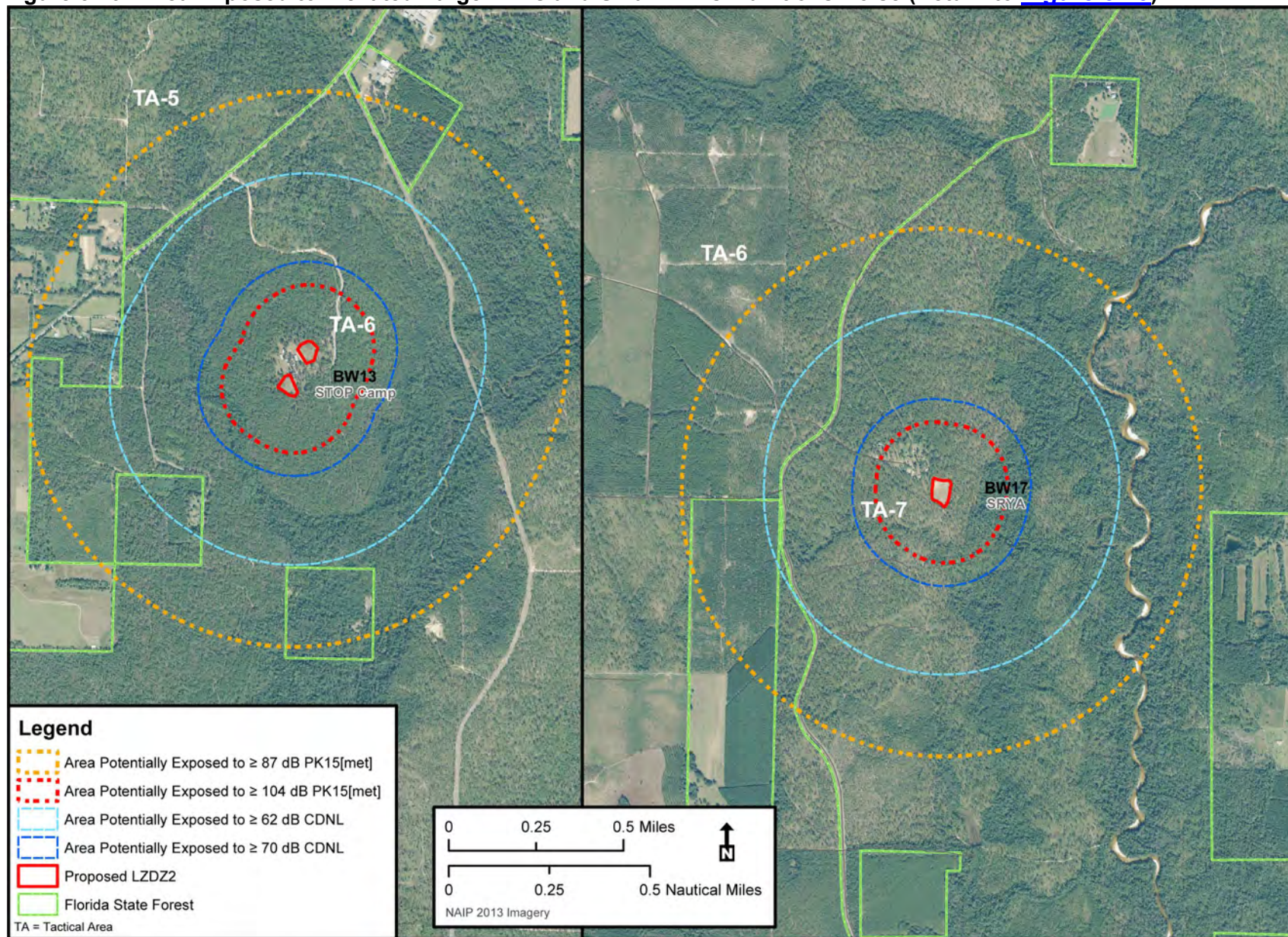
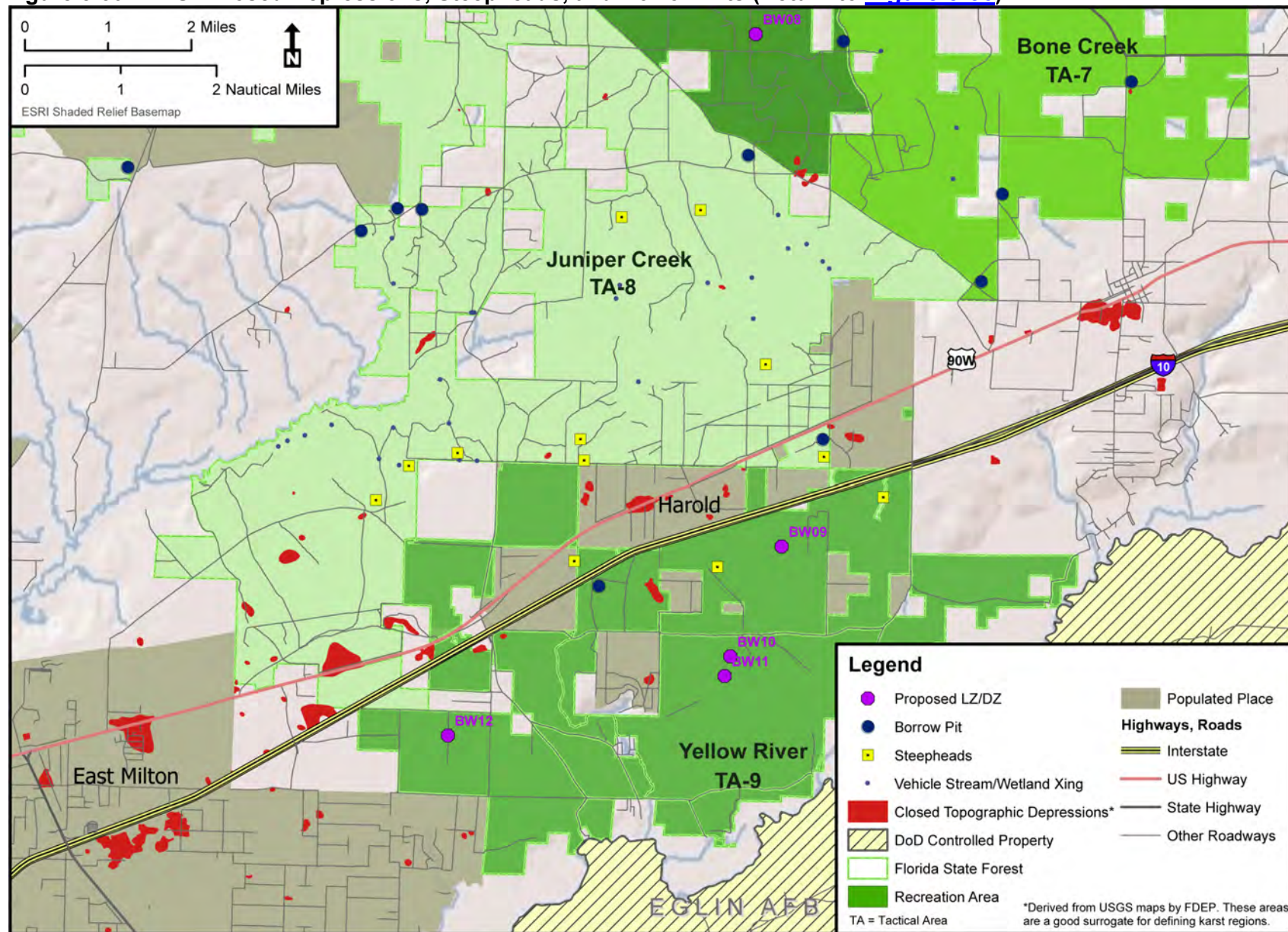




Figure 5-30. BRSF Closed Depressions, Steepheads, and Borrow Pits (Return to [Figure 5-30](#))



**Figure 5-31. Closed Depressions, Steepheads, and Borrow Pits – BW2 & BW3 (Return to [Figure 5-31](#))**

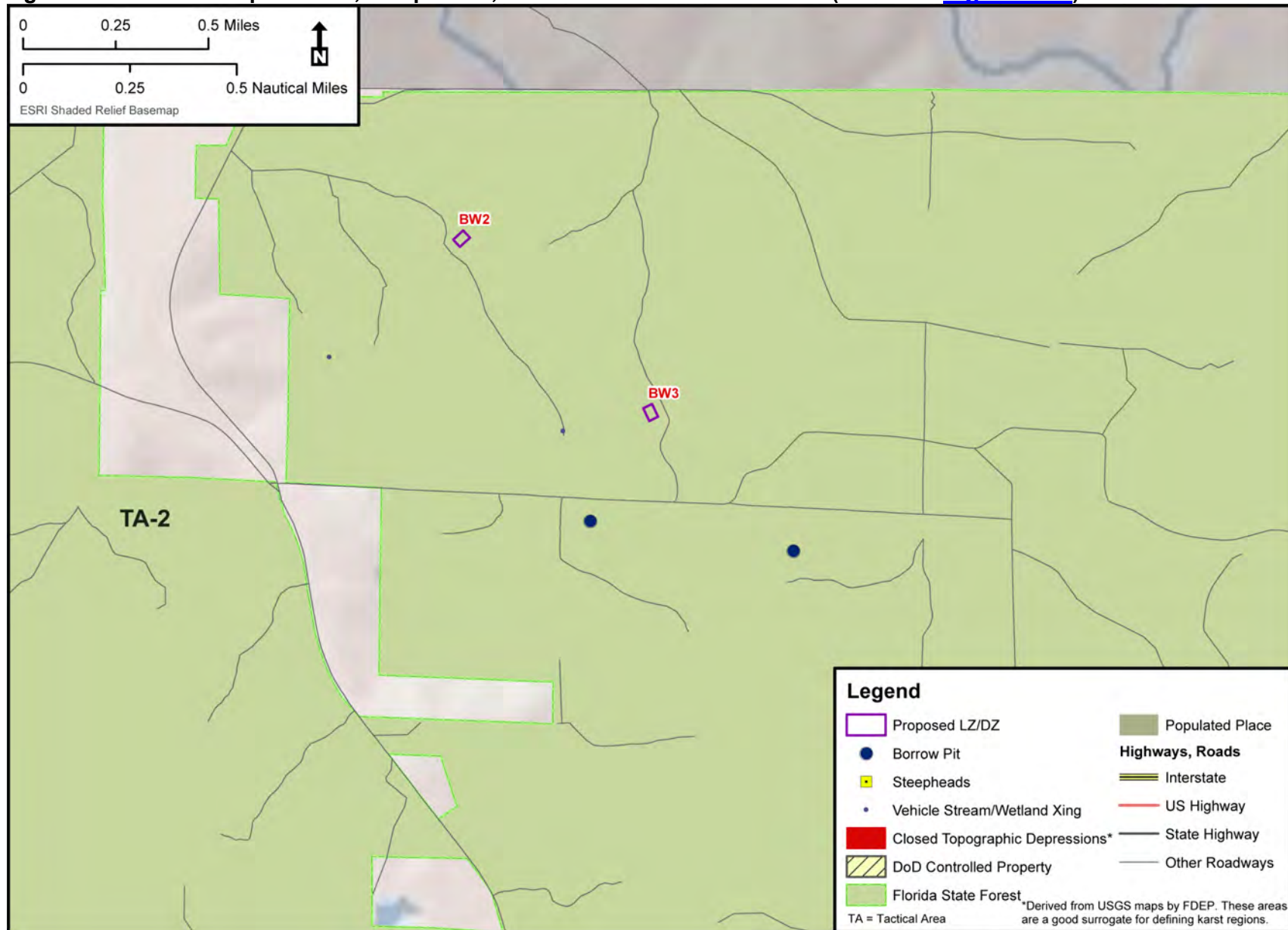
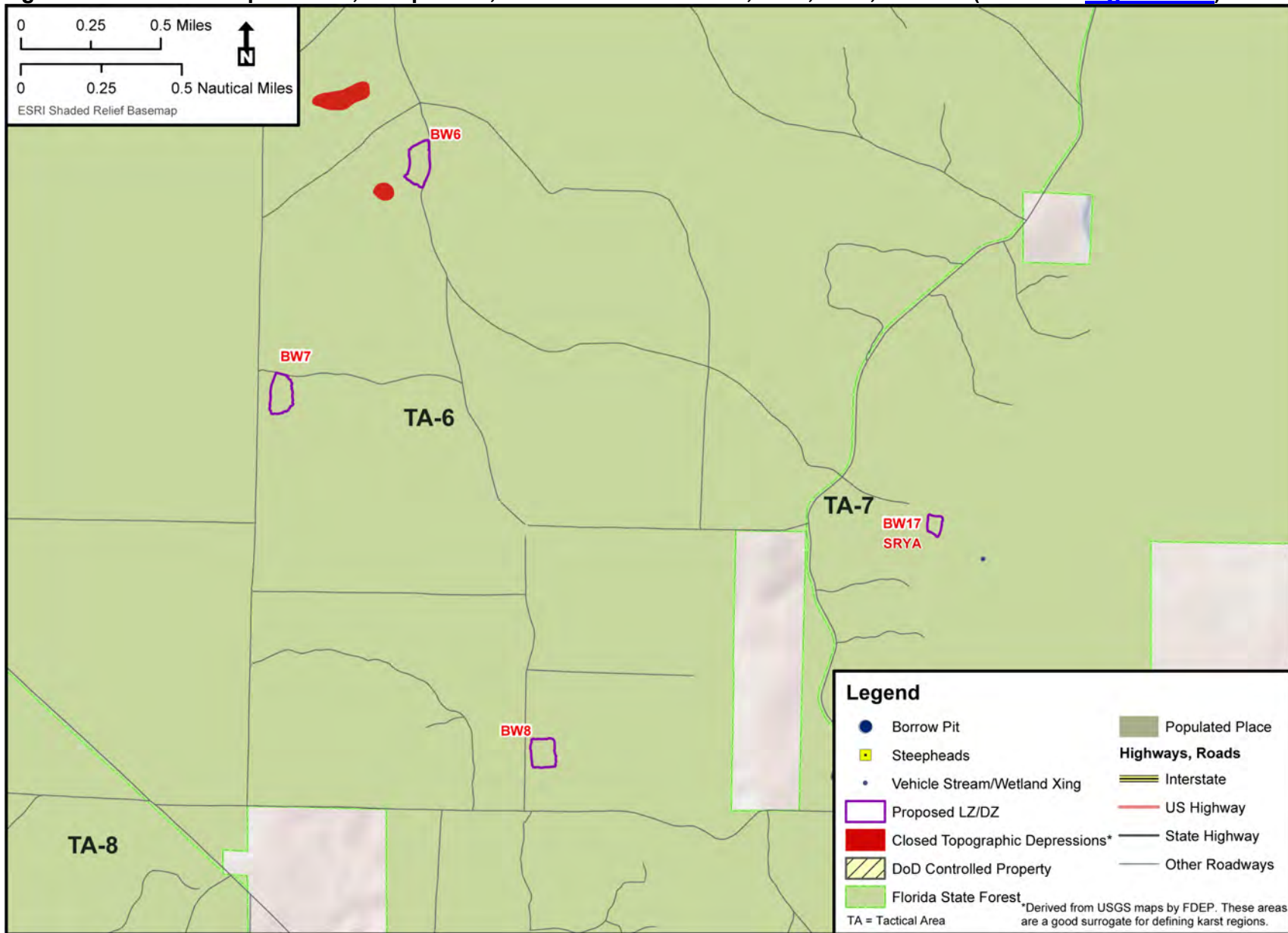




Figure 5-32. Closed Depressions, Steepheads, and Borrow Pits – BW6, BW7, BW8, & BW17 (Return to [Figure 5-32](#))





**Figure 5-33. Closed Depressions, Steepheads, and Borrow Pits – BW9, BW10, BW11, & BW12 (Return to [Figure 5-33](#))**

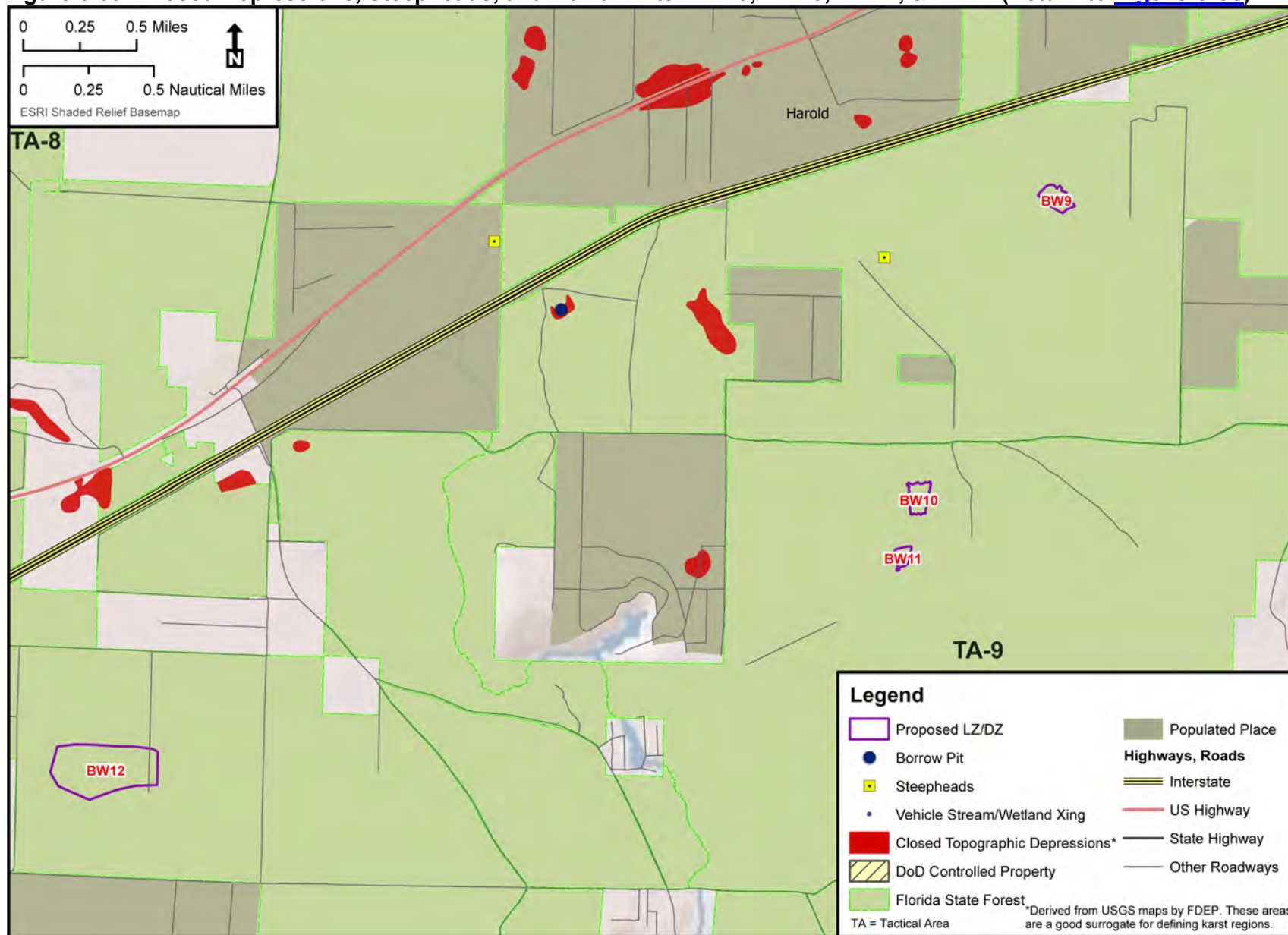


Figure 5-34. Closed Depressions, Steepheads, and Borrow Pits – BW13 and Movement Corridor (Return to [Figure 5-34](#))

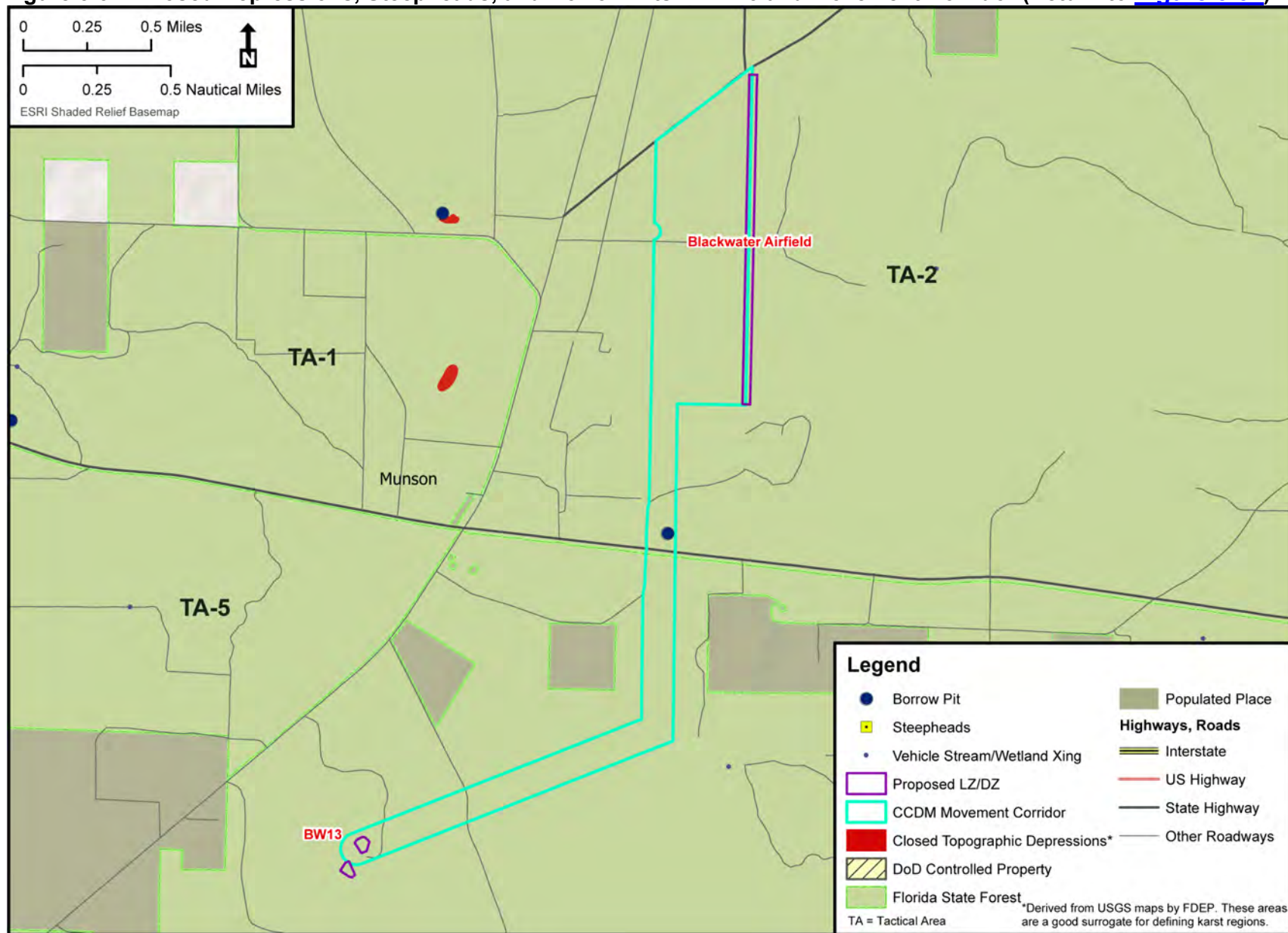


Figure 5-35. Closed Depressions, Steepheads, and Borrow Pits – BW14 (Return to [Figure 5-35](#))

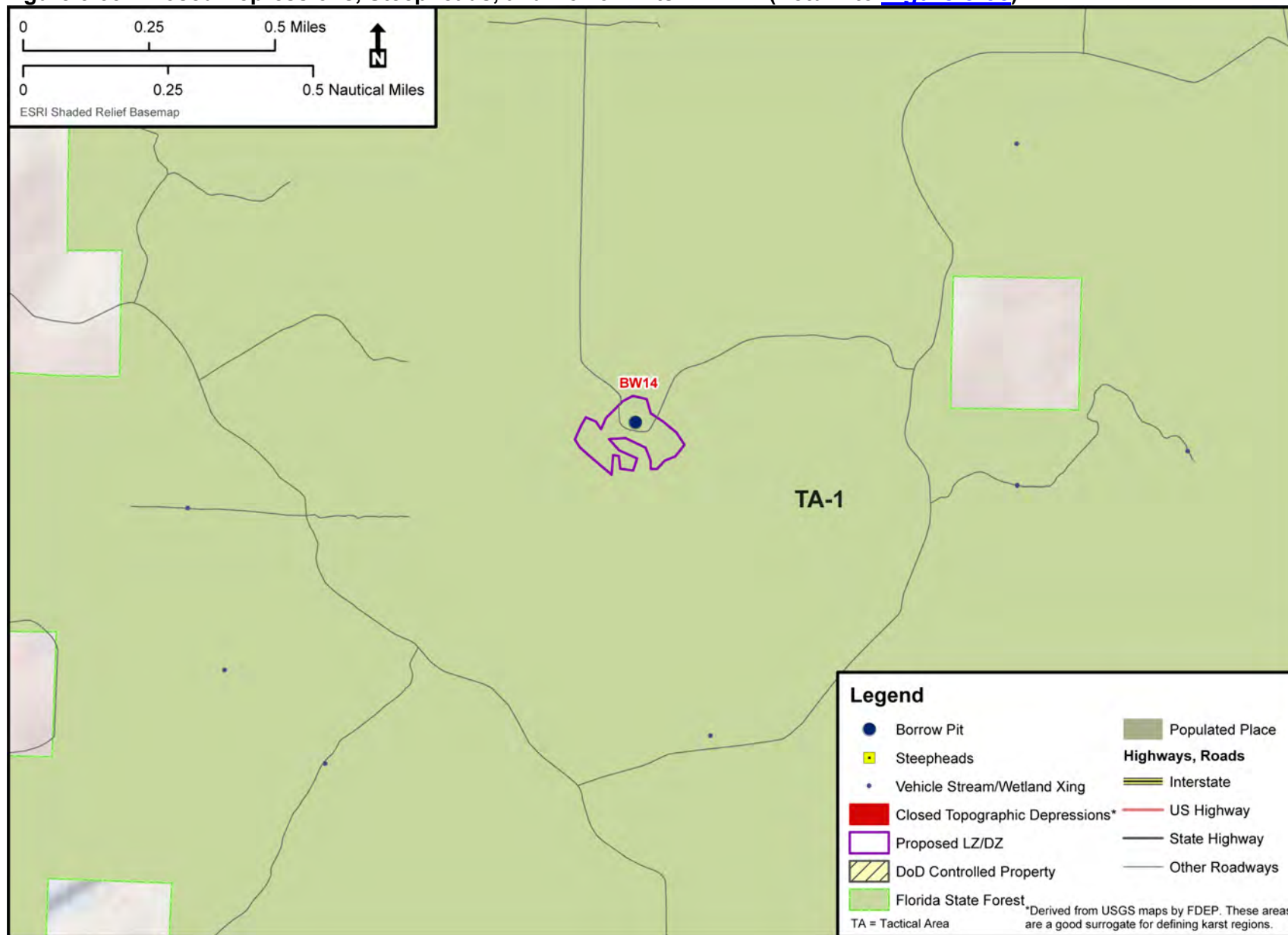




Figure 5-36. BRSF Soil Suborders (Return to [Figure 5-36](#))

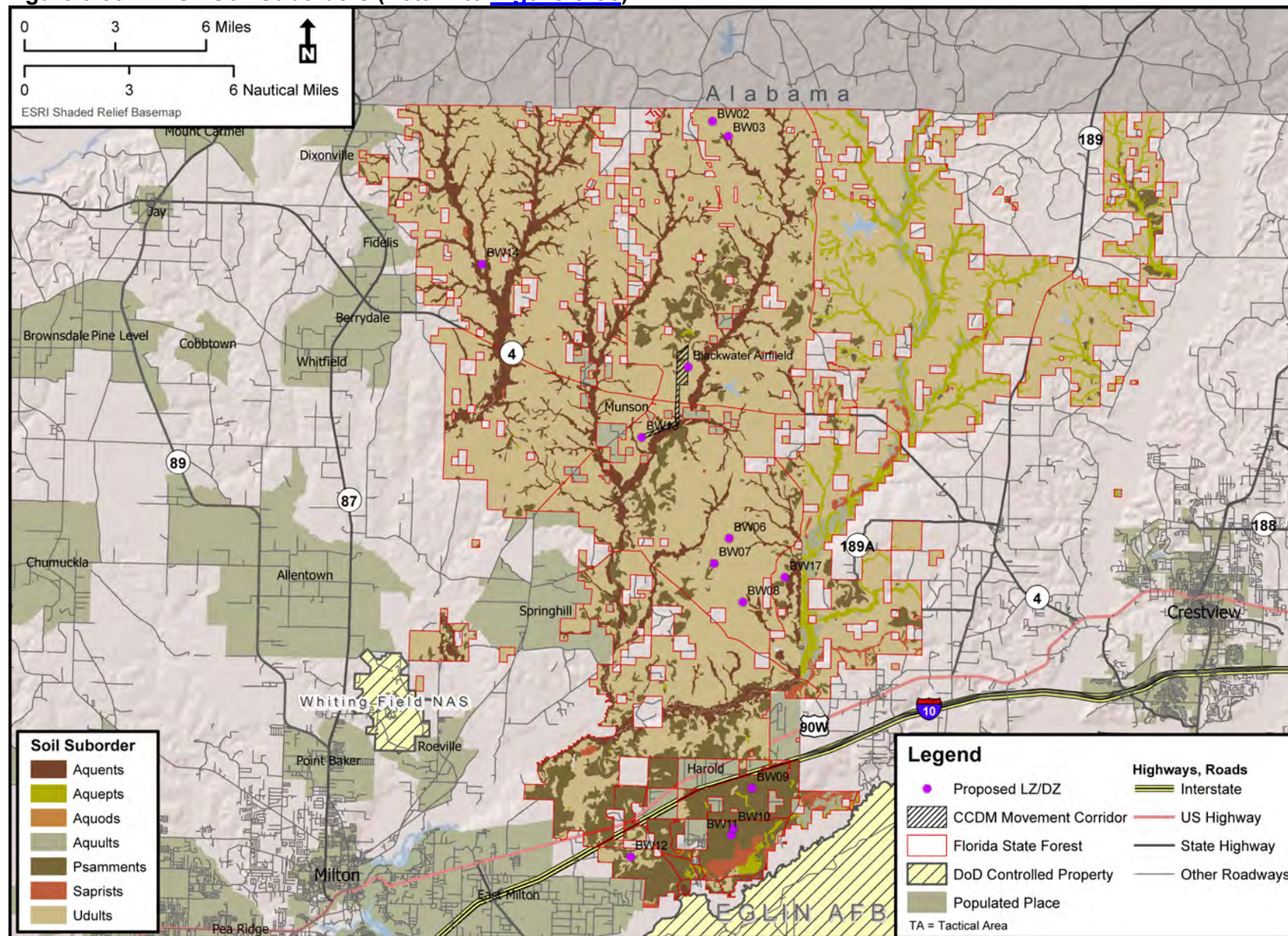




Figure 5-37. BRSF Hydric Soils (Return to [Figure 5-37](#))

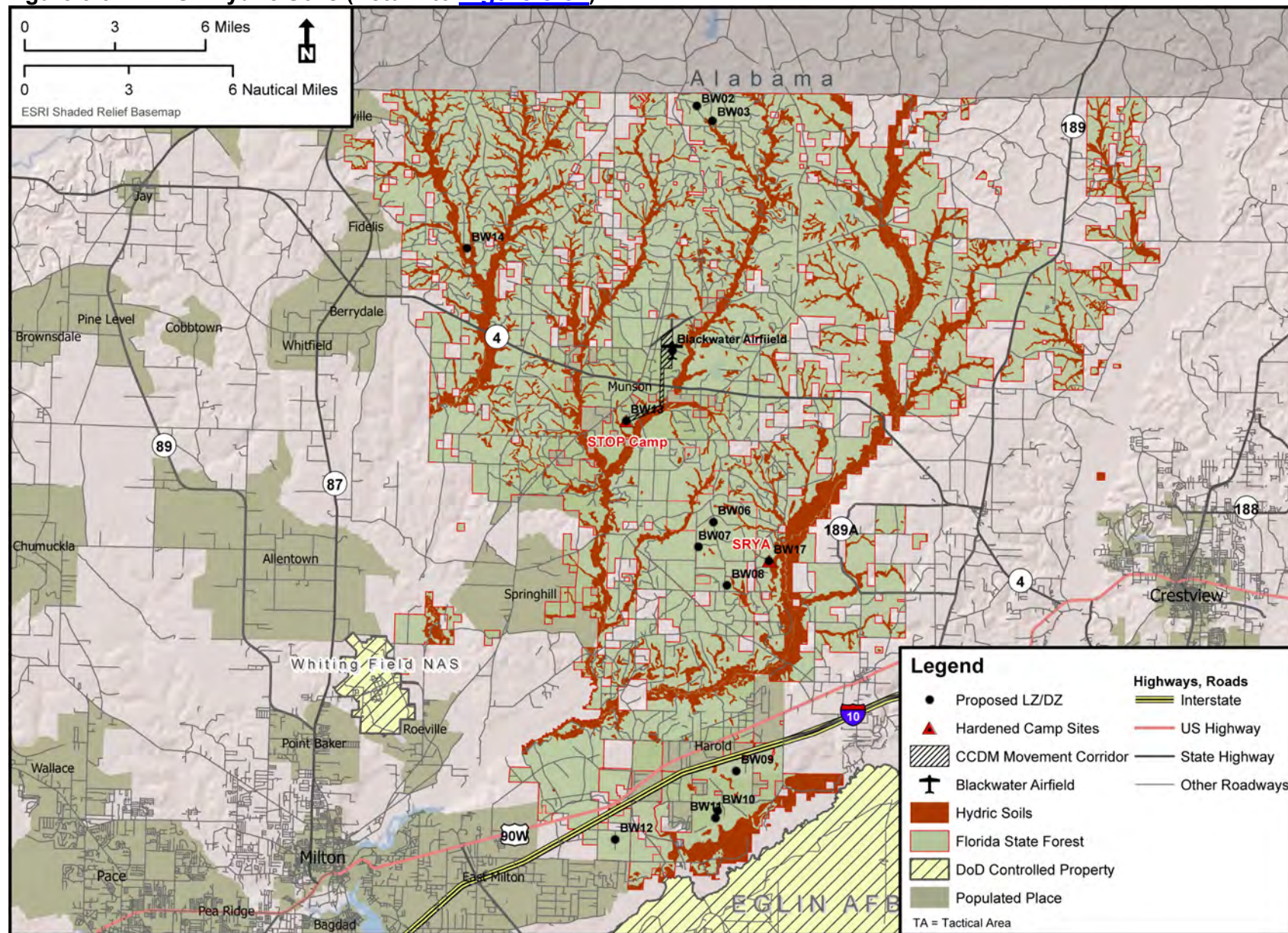




Figure 5-38. Hydric Soils – BW2 & BW3 (Return to [Figure 5-38](#))

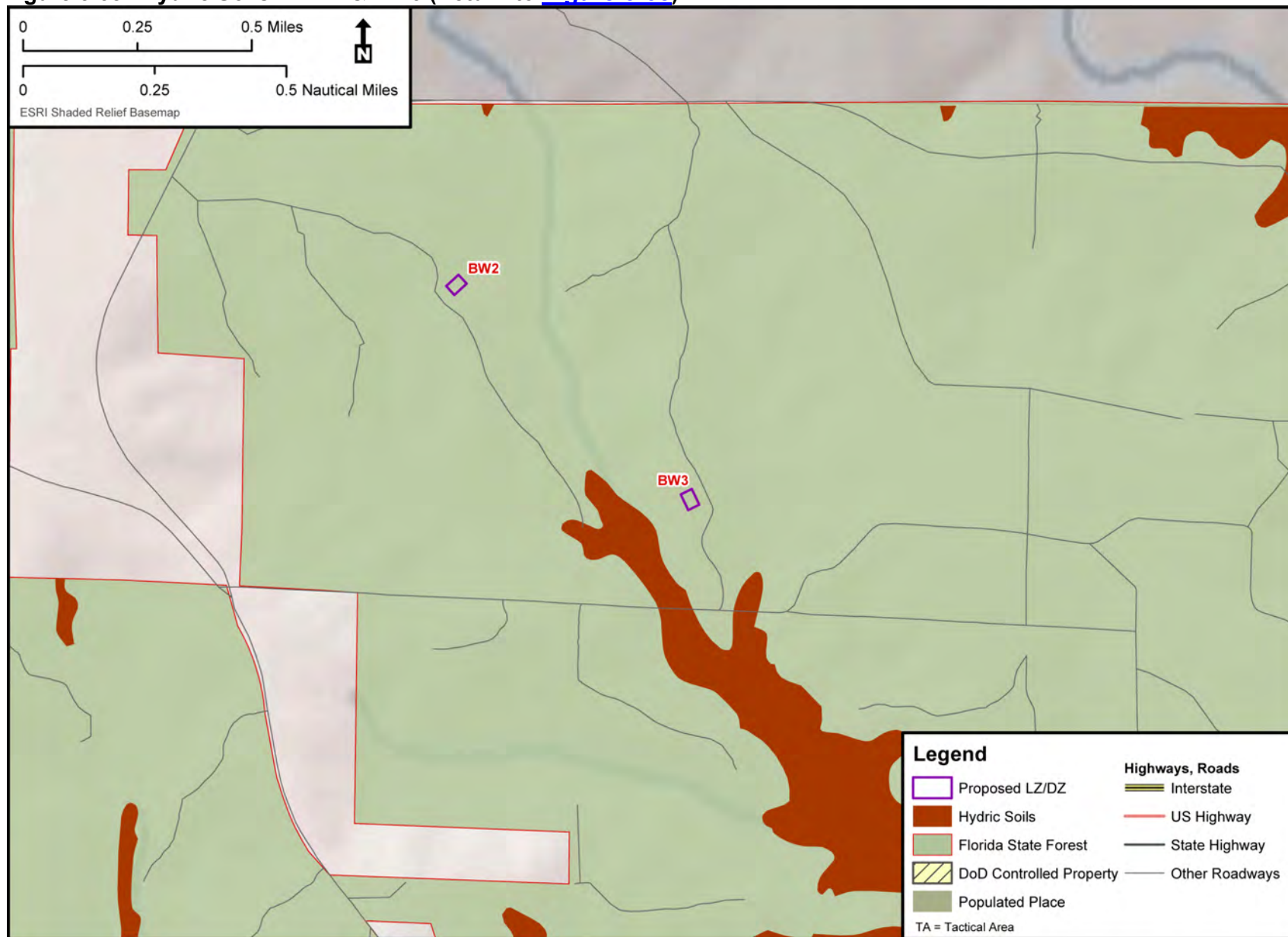


Figure 5-39. Hydric Soils – BW6, BW7, BW8, & BW17 (Return to [Figure 5-39](#))

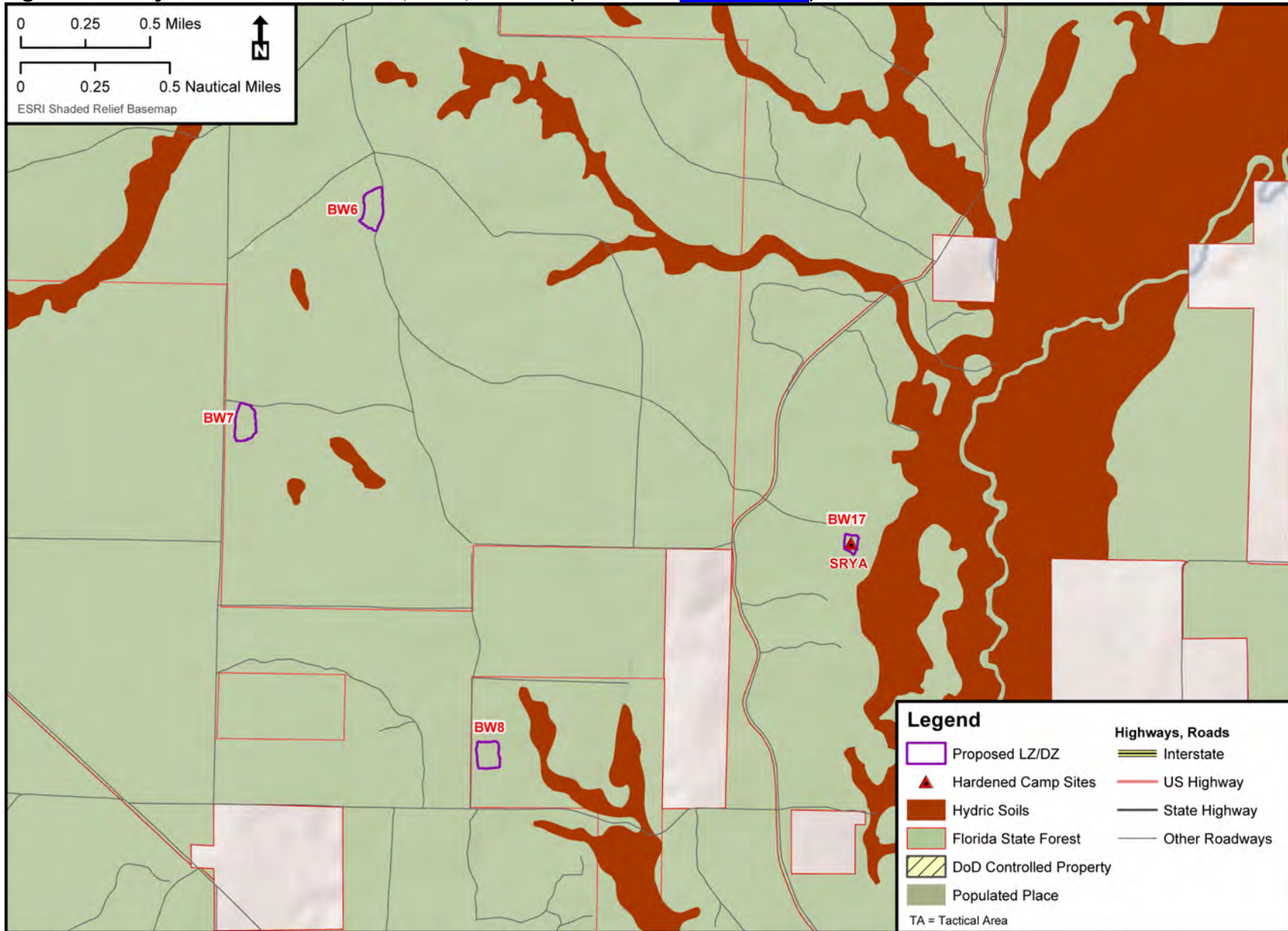




Figure 5-40. Hydric Soils – BW9, BW10, BW11, & BW12 (Return to [Figure 5-40](#))

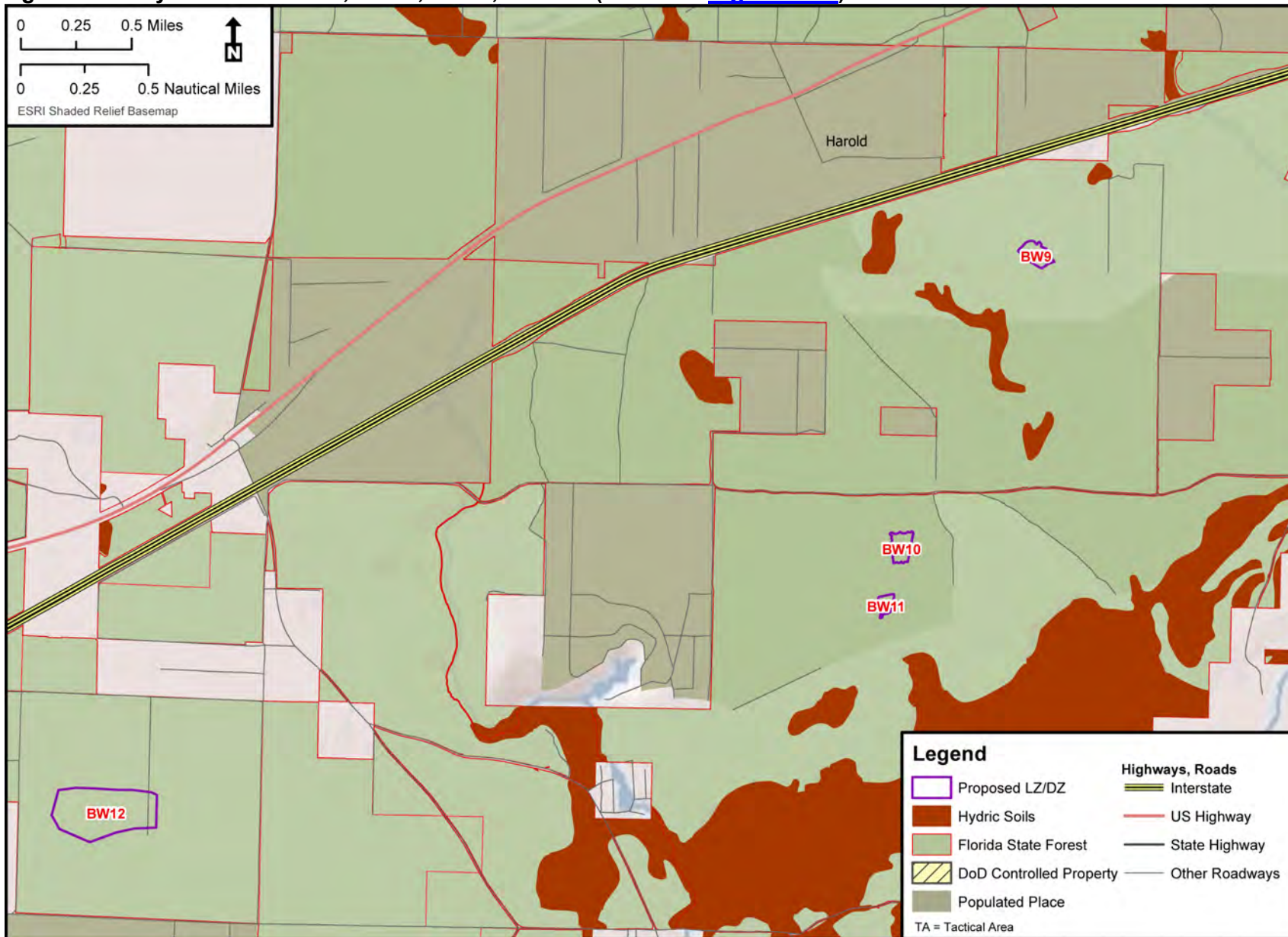




Figure 5-41. Hydric Soils – BW13 and Movement Corridor (Return to [Figure 5-41](#))

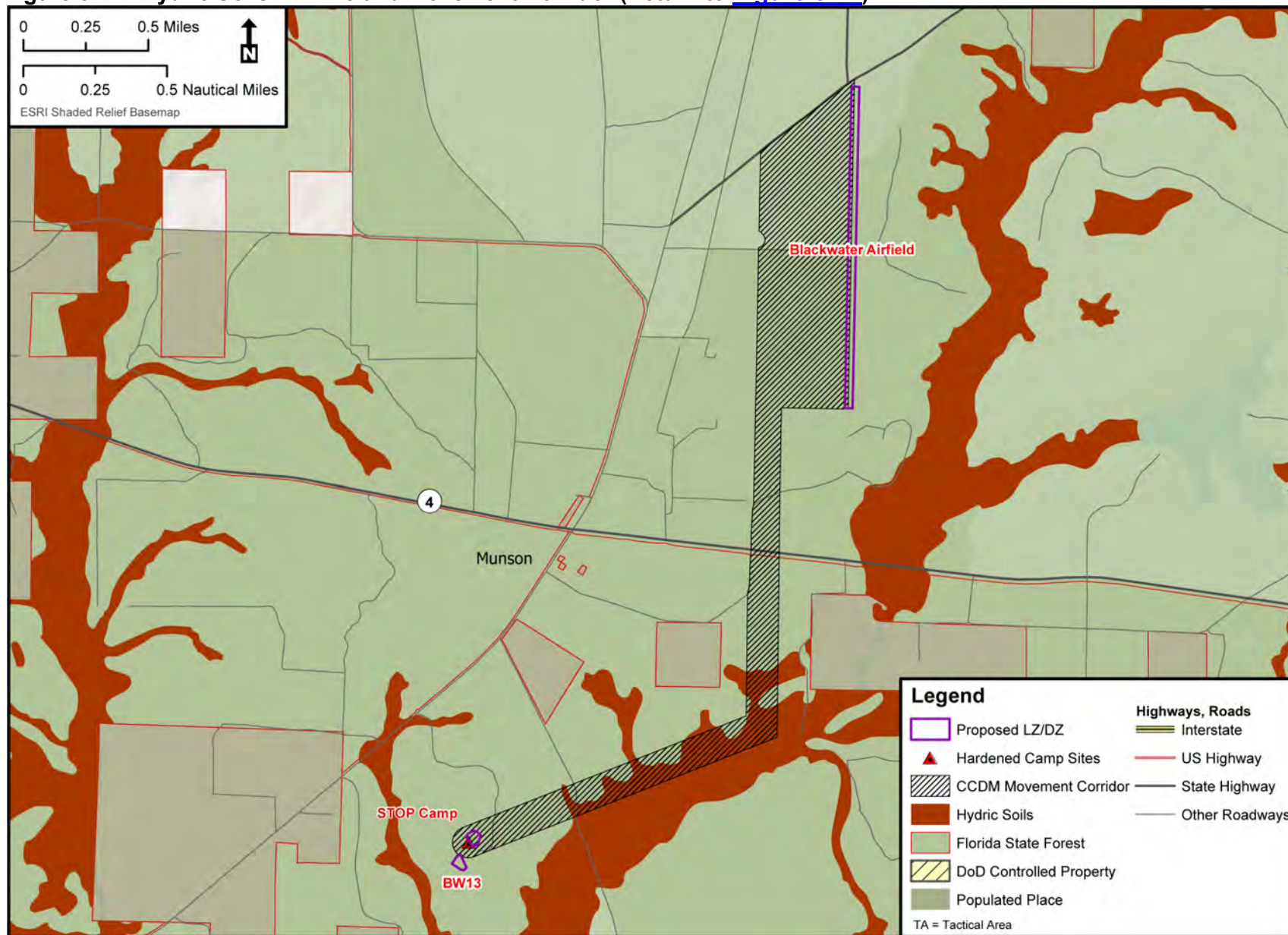


Figure 5-42. Hydric Soils – BW14 (Return to [Figure 5-42](#))

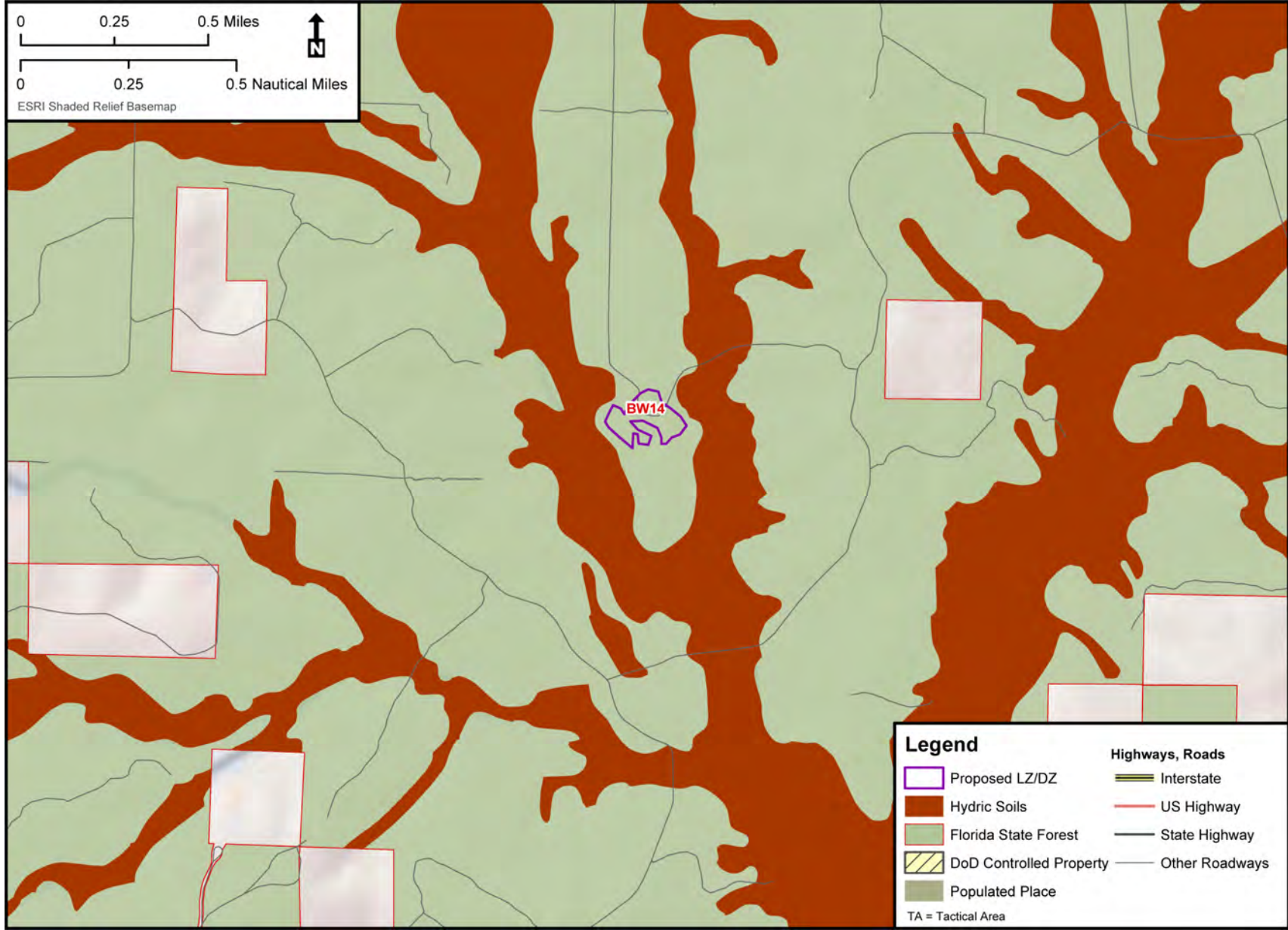




Figure 5-43. BRSF Prime Farmland (Return to [Figure 5-43](#))

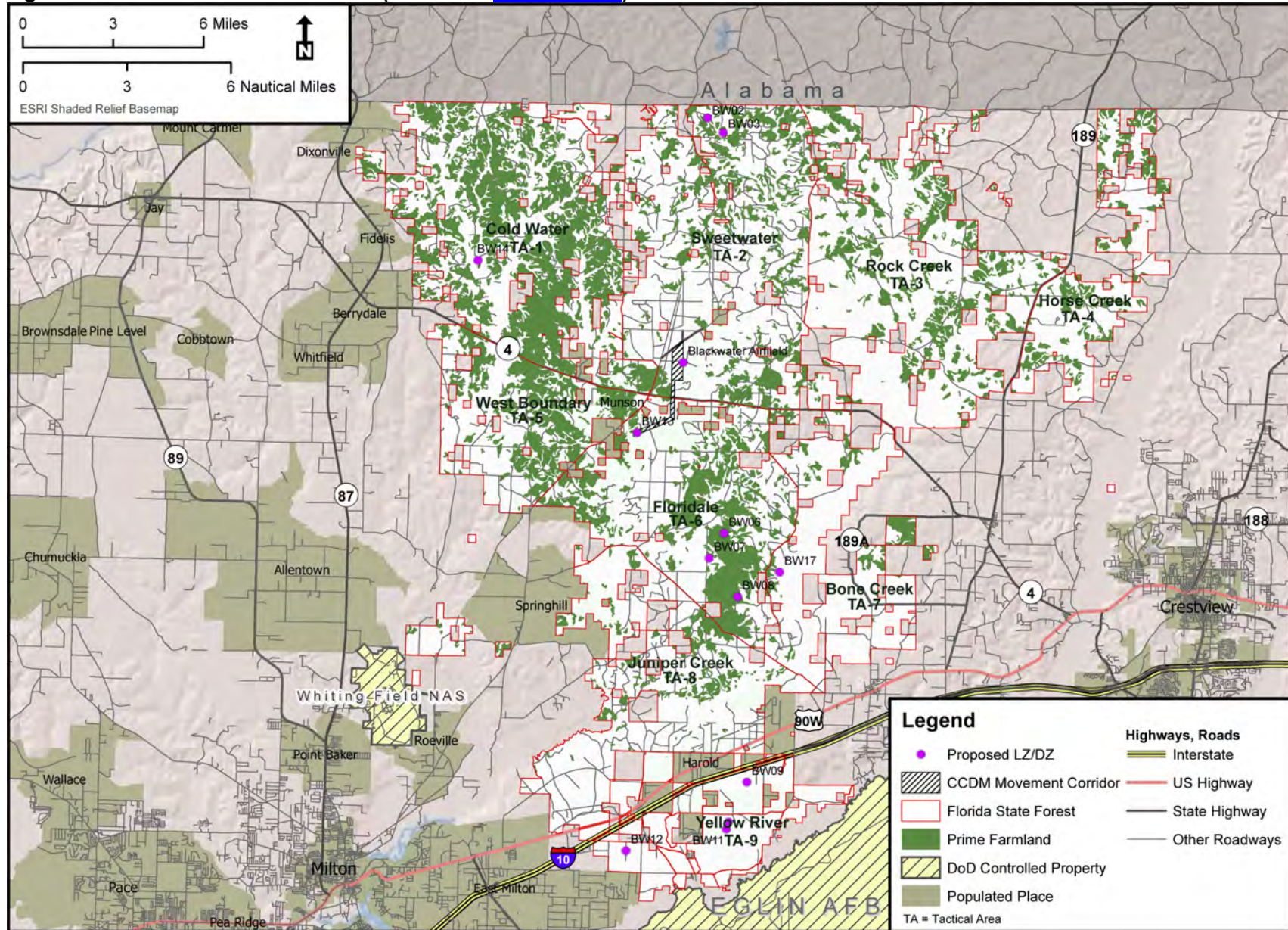
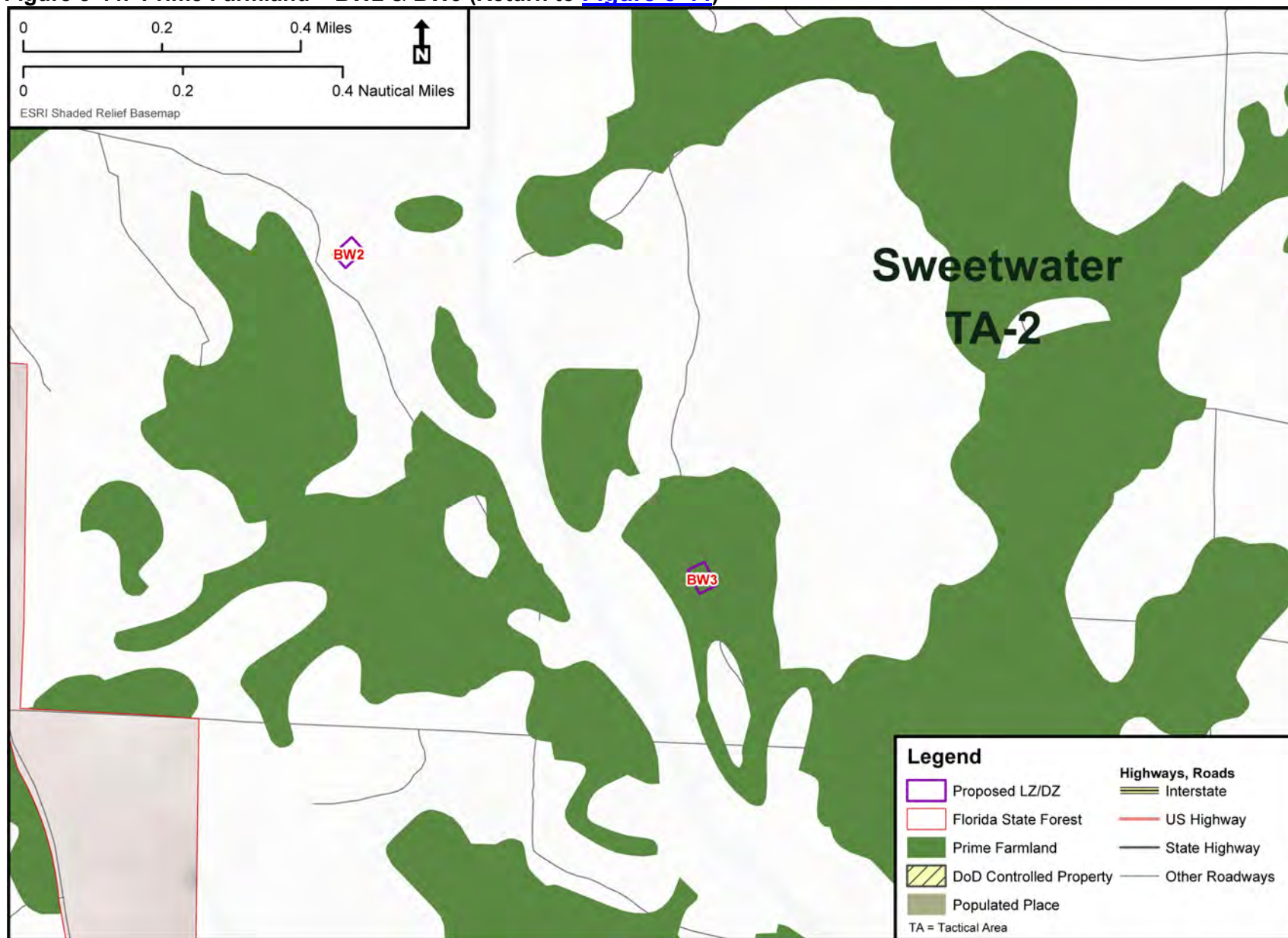




Figure 5-44. Prime Farmland – BW2 & BW3 (Return to [Figure 5-44](#))





**Figure 5-45. Prime Farmland – BW6, BW7, BW8, & BW17 (Return to [Figure 5-45](#))**

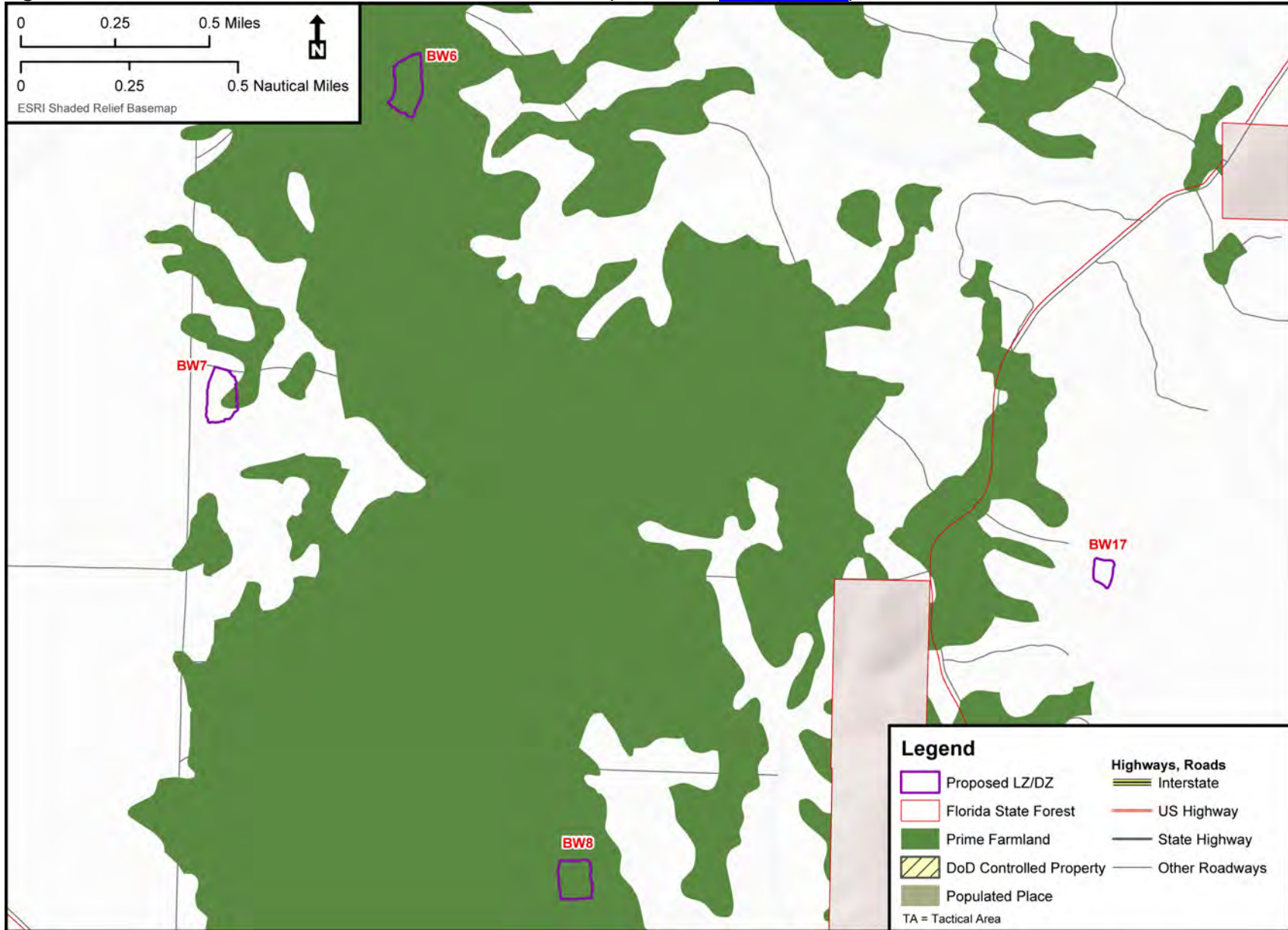
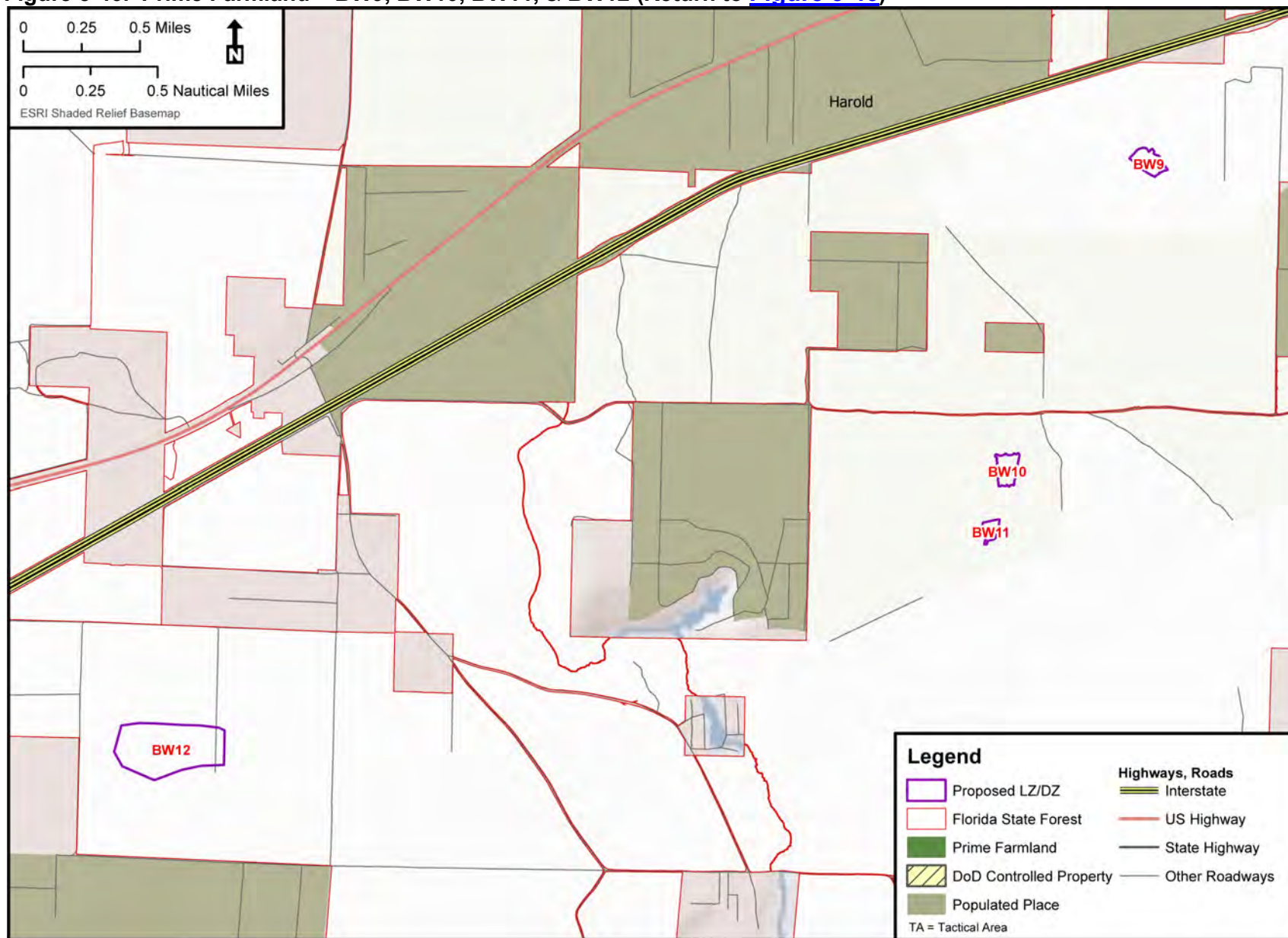


Figure 5-46. Prime Farmland – BW9, BW10, BW11, & BW12 (Return to [Figure 5-46](#))





**Figure 5-47. Prime Farmland – BW13 and Movement Corridor (Return to [Figure 5-47](#))**

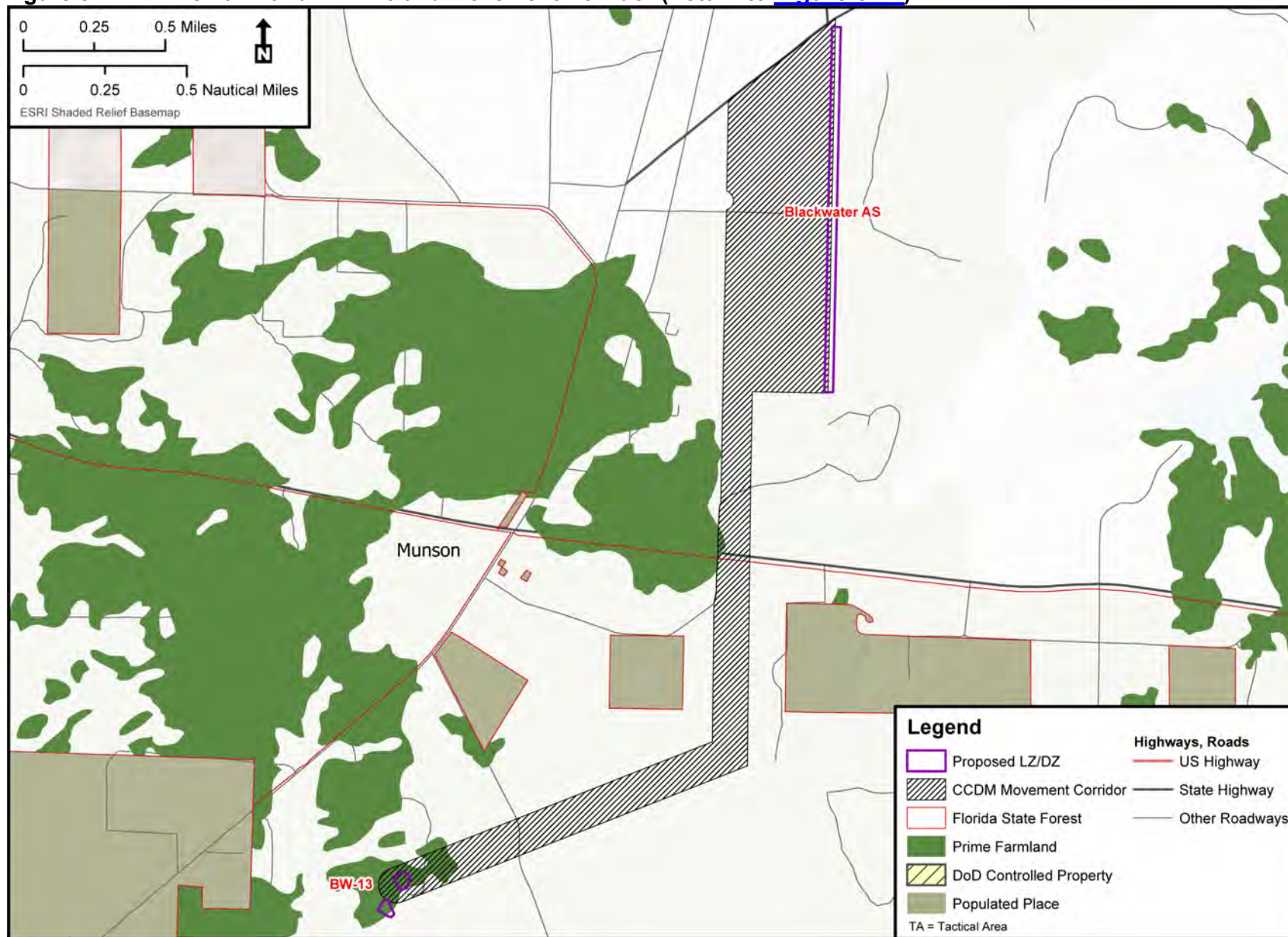
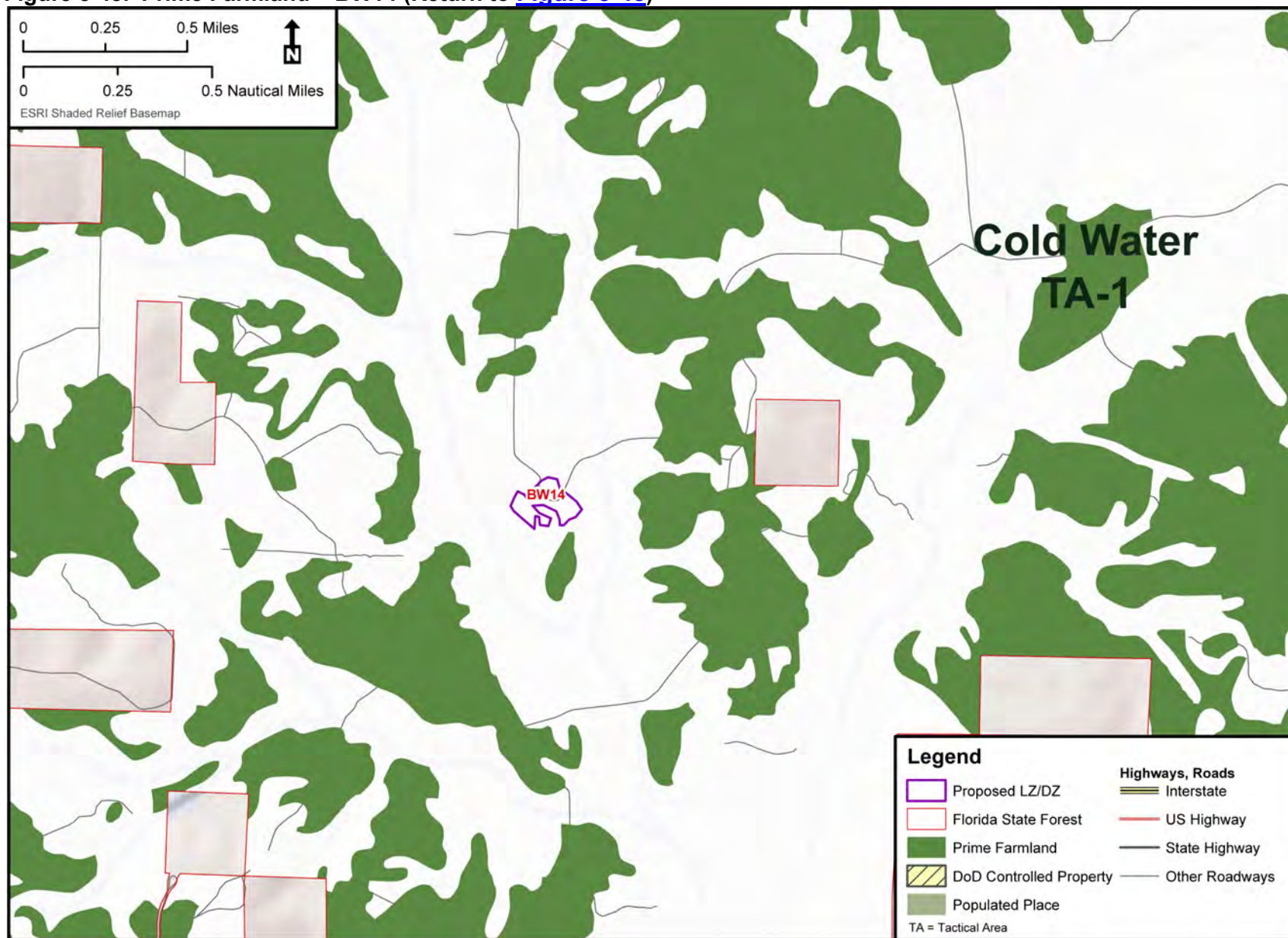


Figure 5-48. Prime Farmland – BW14 (Return to [Figure 5-48](#))





**Figure 5-49. BRSF Highly Erodible and Potentially Highly Erodible Soils (Return to [Figure 5-49](#))**

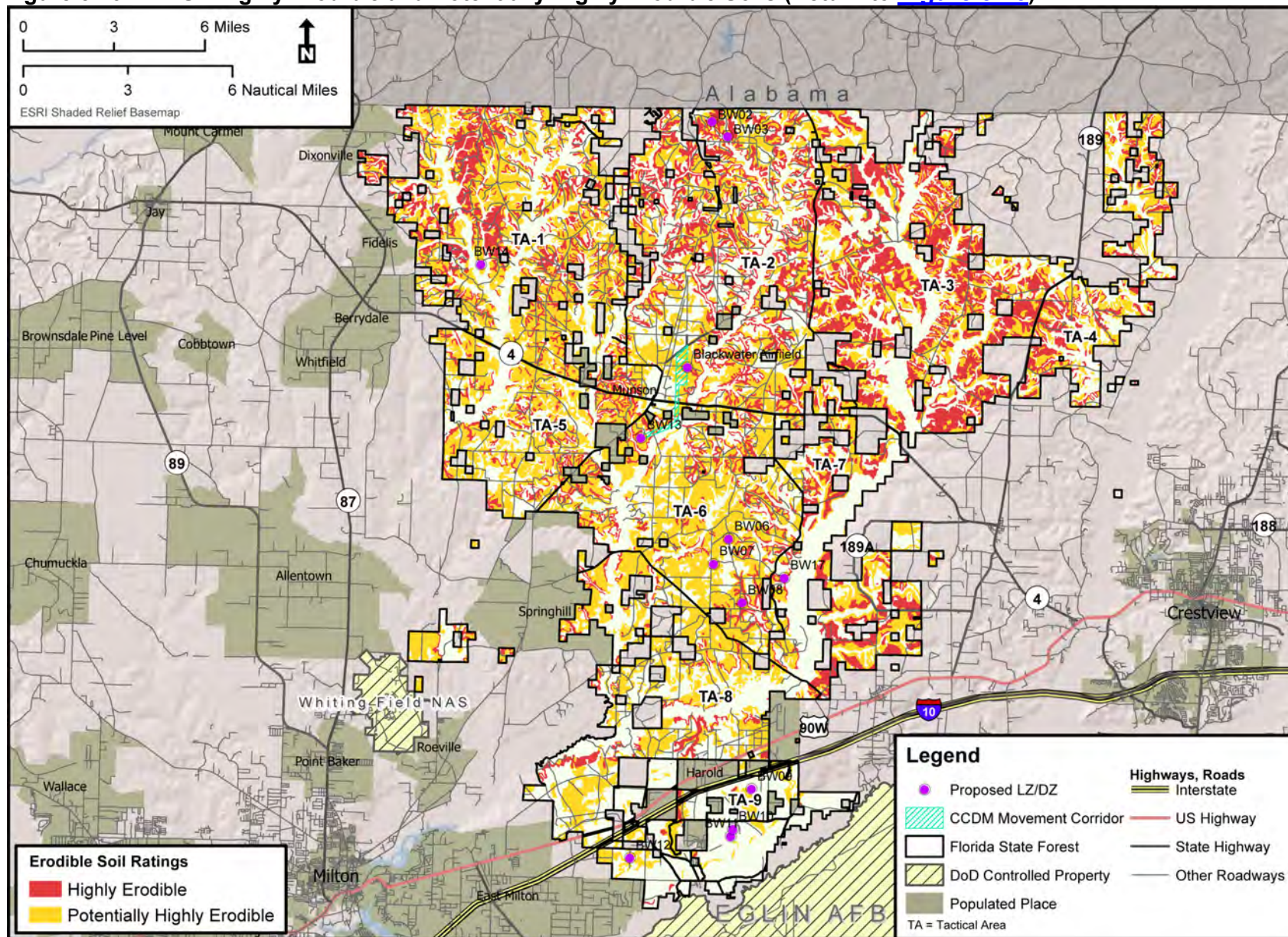
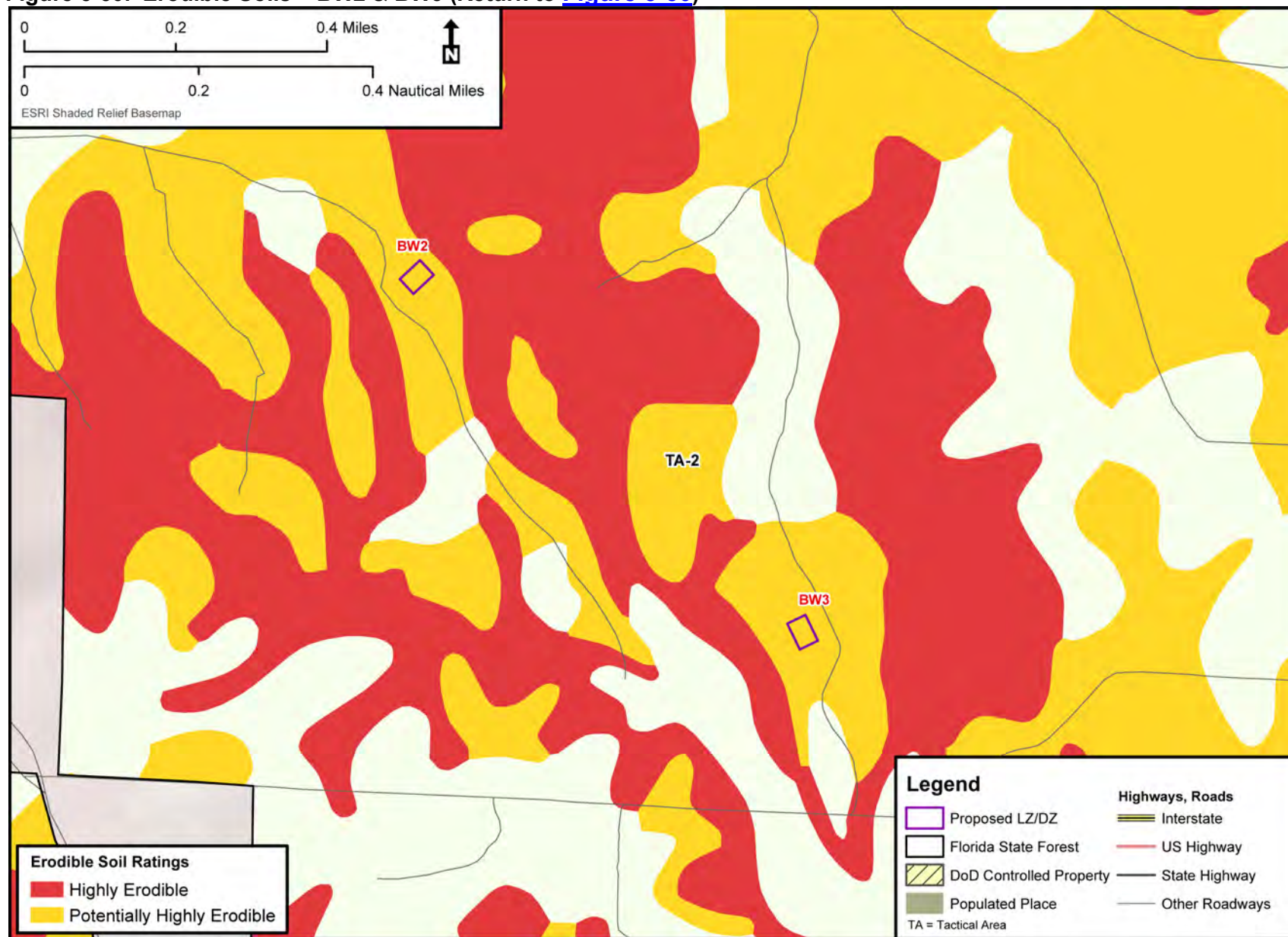




Figure 5-50. Erodible Soils – BW2 & BW3 (Return to [Figure 5-50](#))



**Figure 5-51. Erodeable Soils – BW6, BW7, BW8, & BW17 (Return to [Figure 5-51](#))**

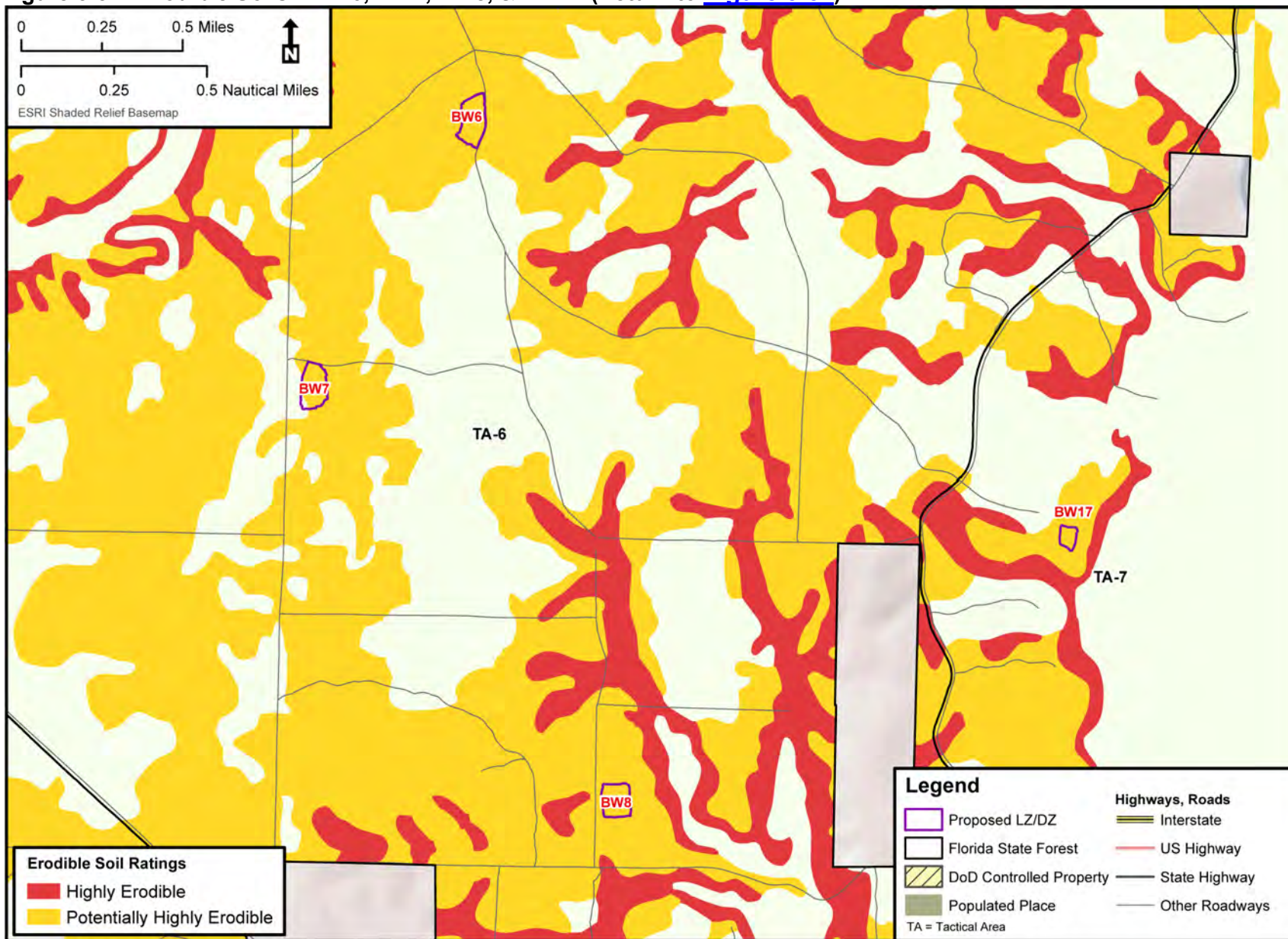




Figure 5-52. Erodible Soils – BW9, BW10, BW11, & BW12 (Return to [Figure 5-52](#))

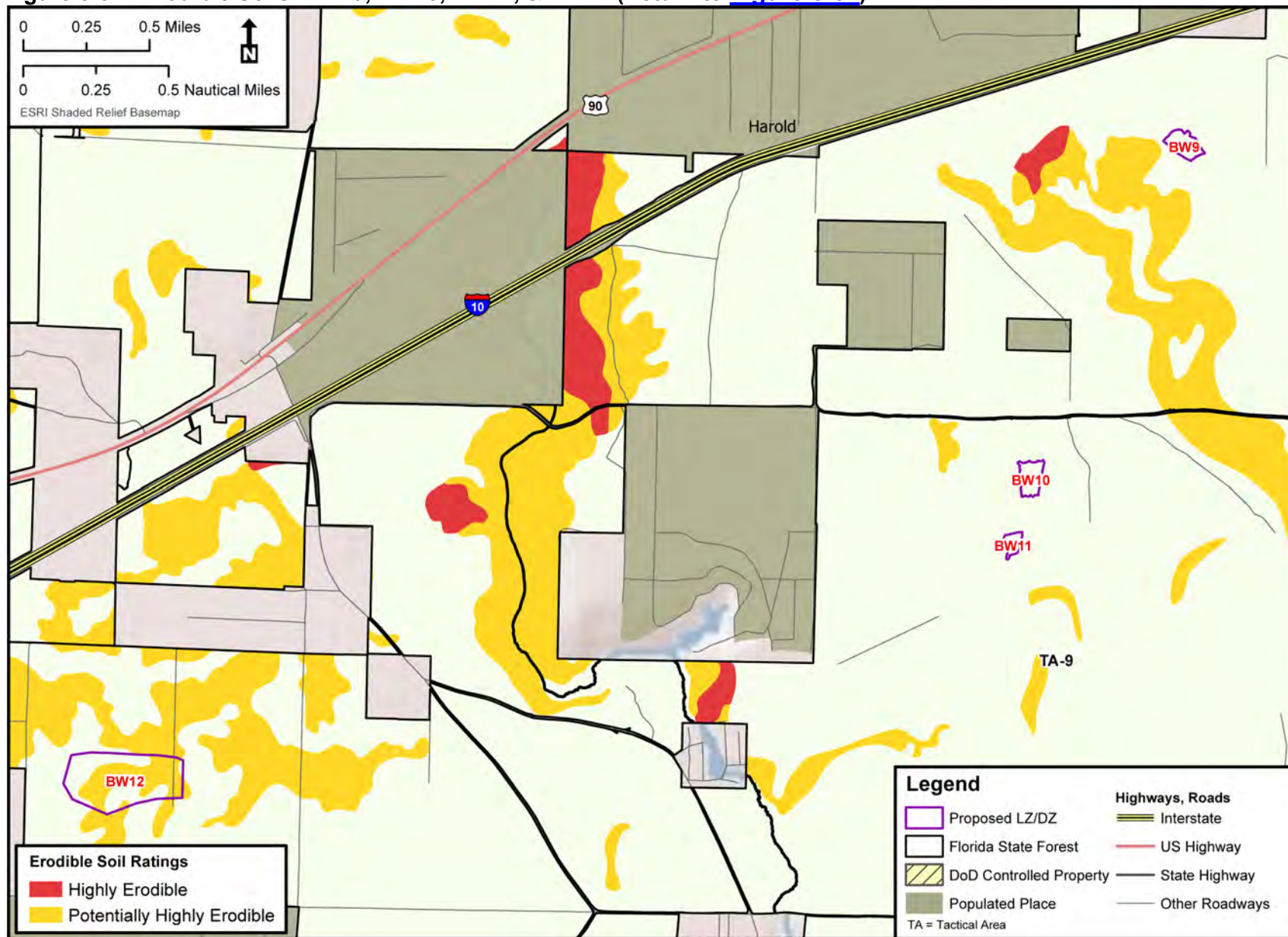




Figure 5-53. Erodible Soils – BW13 and Movement Corridor (Return to [Figure 5-53](#))

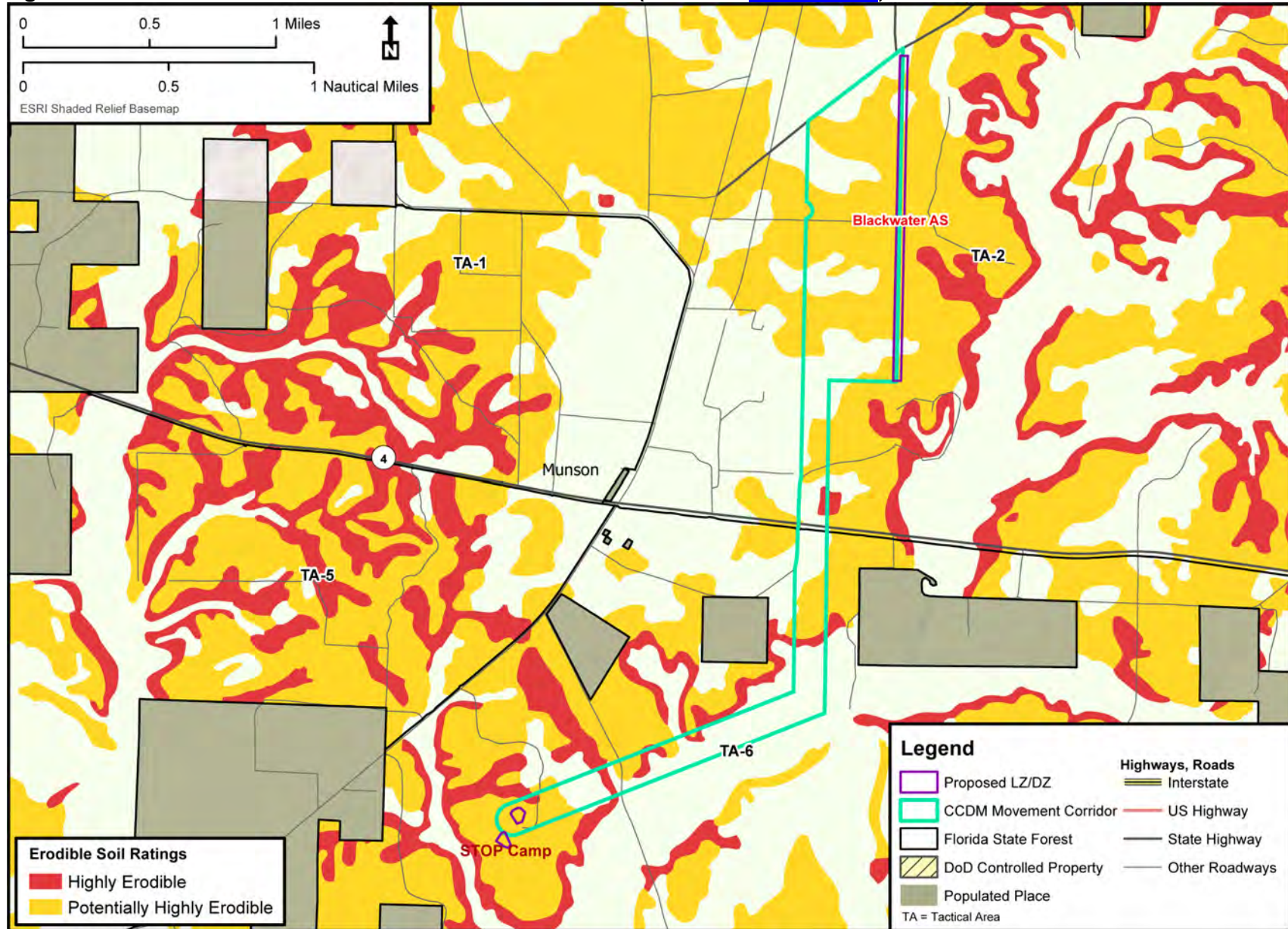


Figure 5-54. Erodible Soils – BW14 (Return to [Figure 5-54](#))

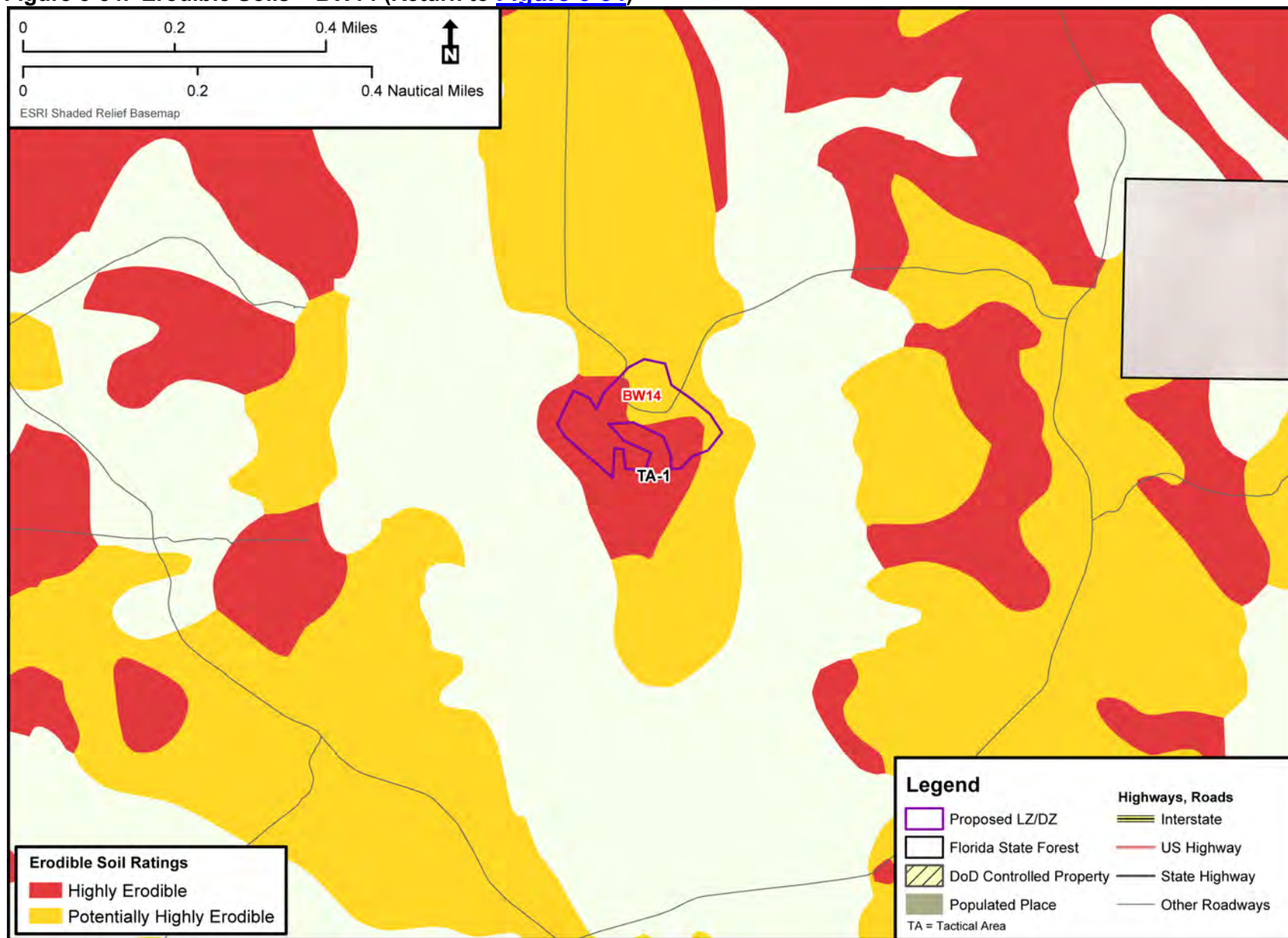




Figure 5-55. BRSF Bivouac Constraint Areas (Return to [Figure 5-55](#))

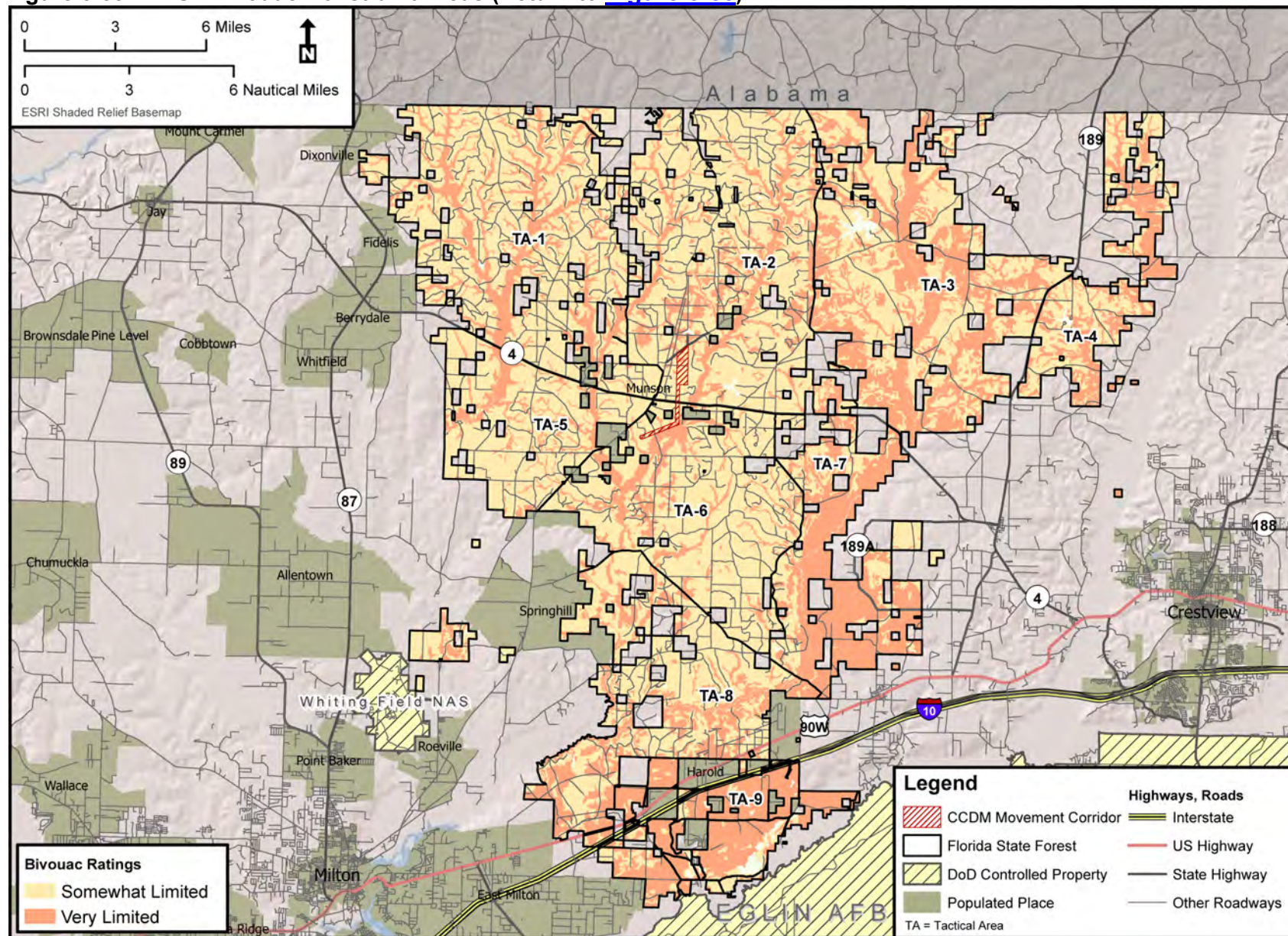




Figure 5-56. Movement Corridor Bivouac Constraint Areas (Return to [Figure 5-56](#))

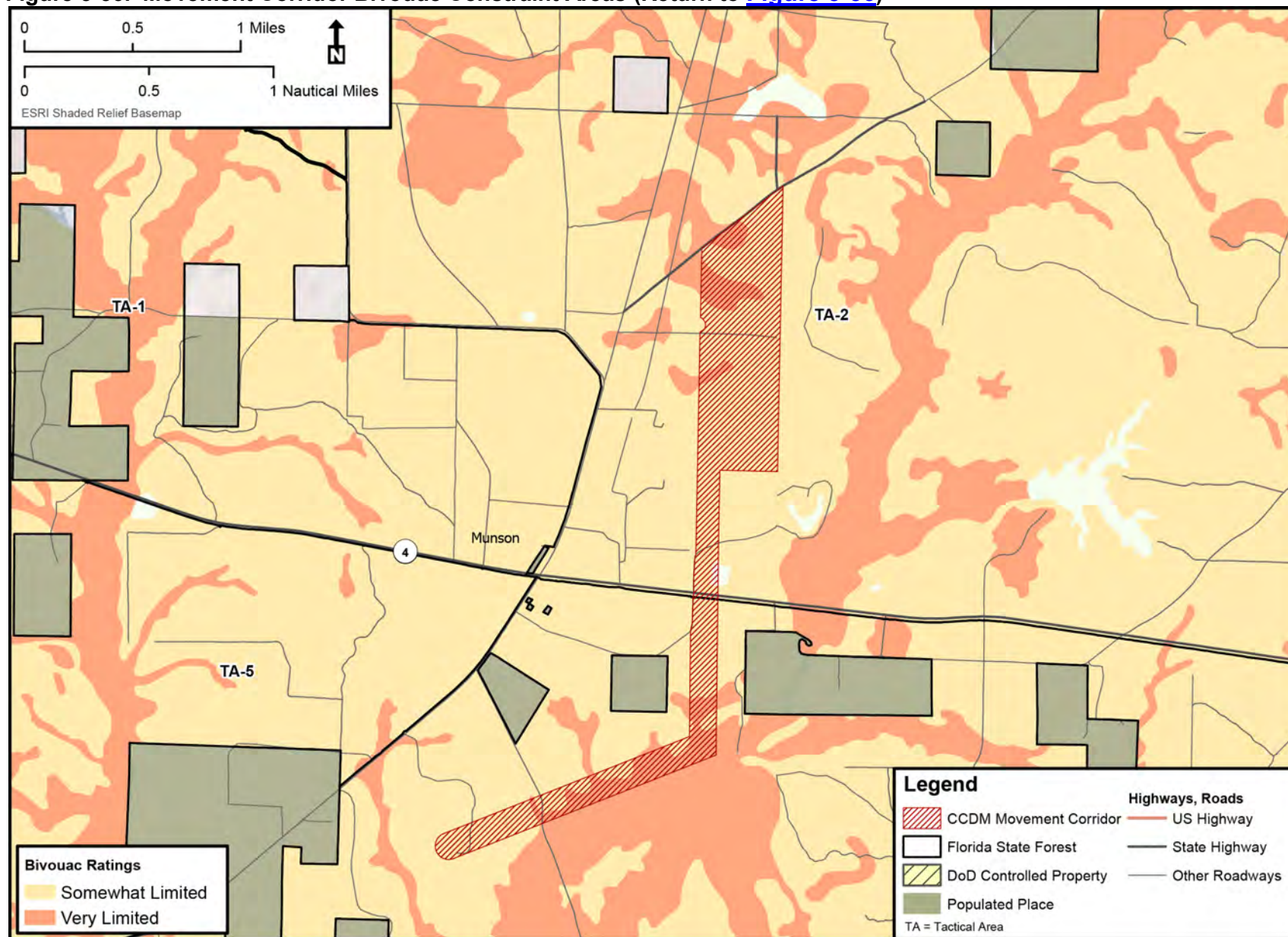




Figure 5-57. BRSF Helicopter Landing Zone Constraint Areas (Return to [Figure 5-57](#))

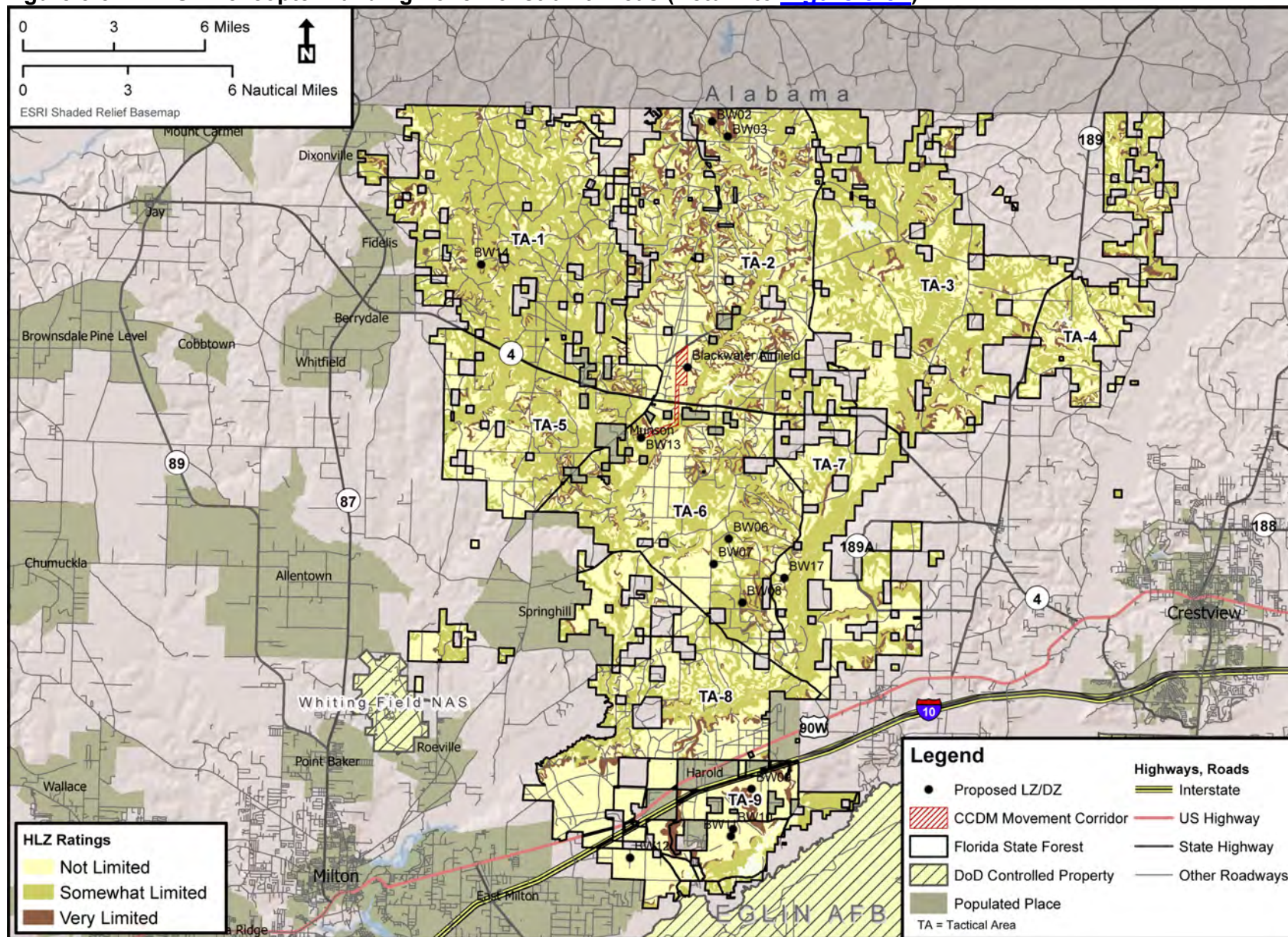




Figure 5-58. LZ/DZ Constraint Areas – BW2 & BW3 (Return to [Figure 5-58](#))

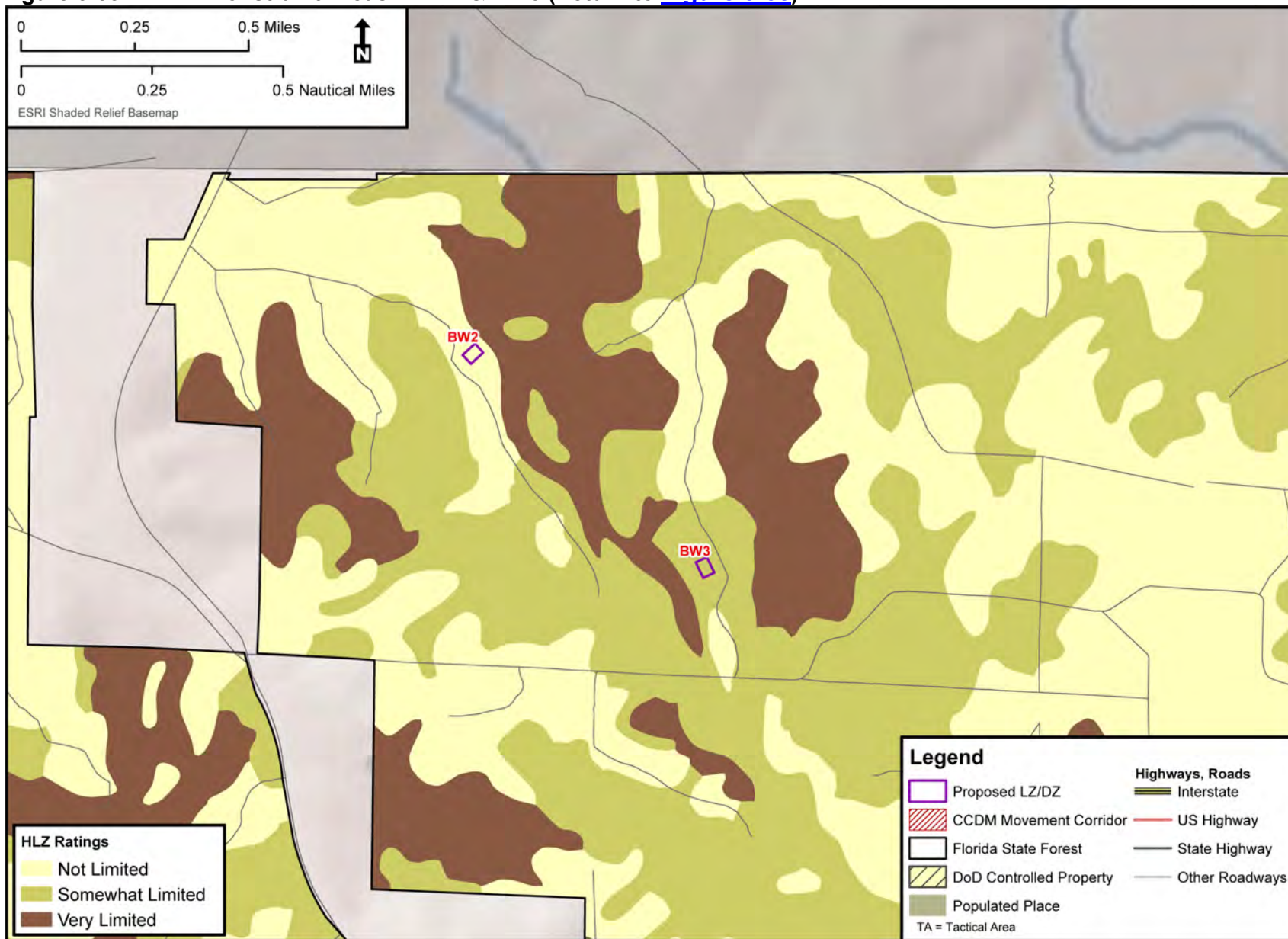


Figure 5-59. LZ/DZ Constraint Areas – BW6, BW7, BW8, & BW17 (Return to [Figure 5-59](#))

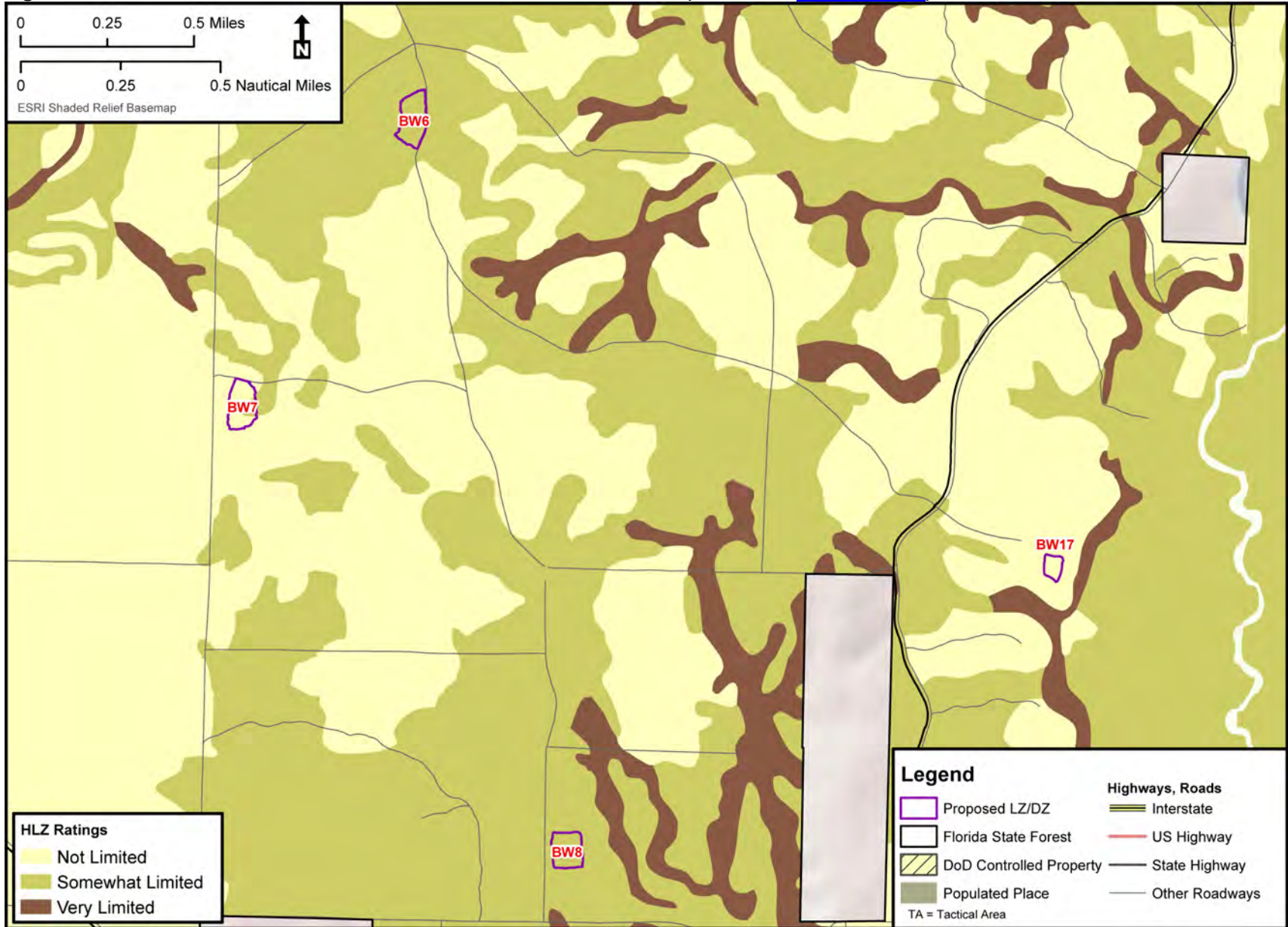




Figure 5-60. LZ/DZ Constraint Areas – BW9, BW10, BW11, & BW12 (Return to [Figure 5-60](#))

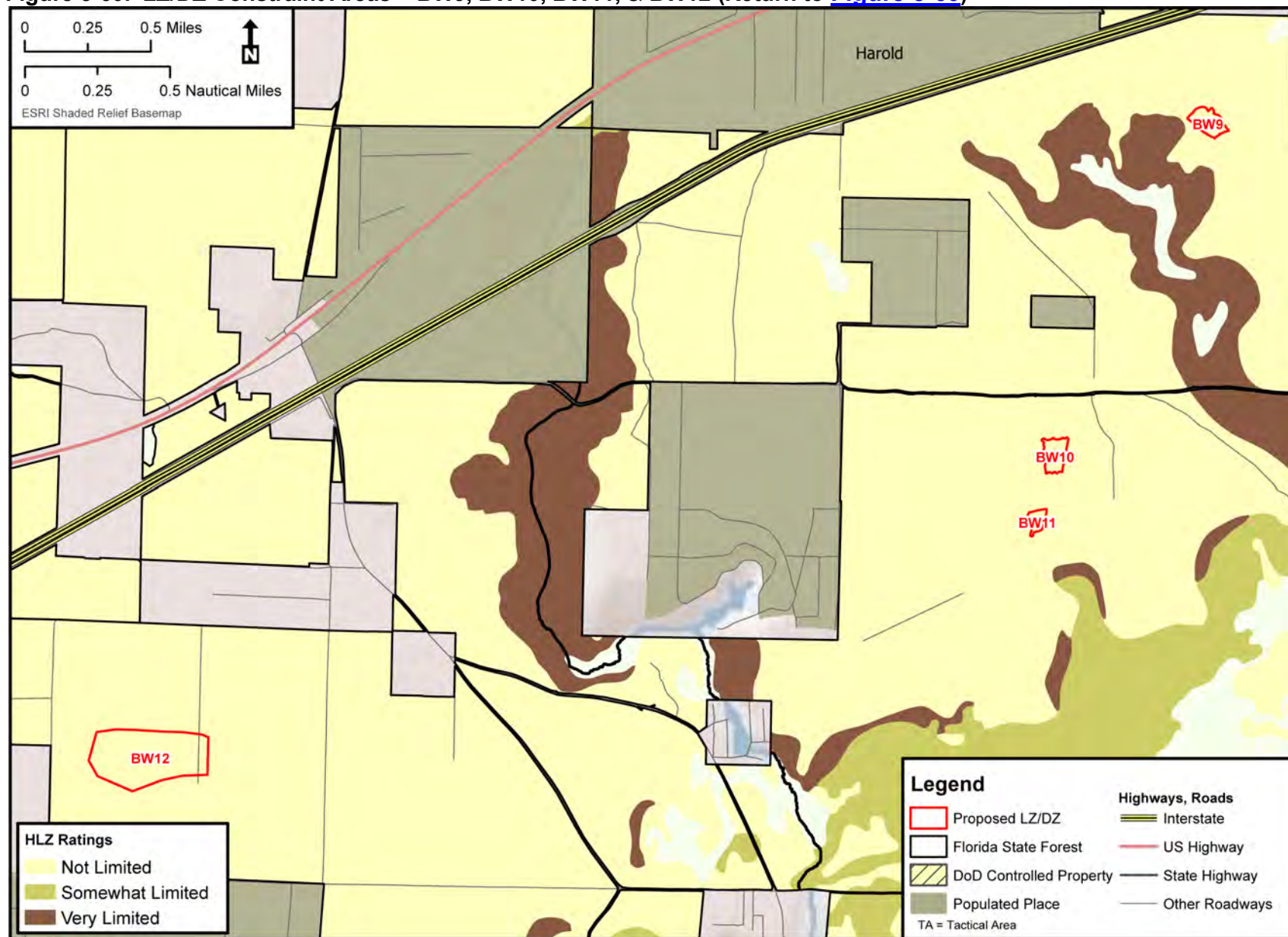




Figure 5-61. LZ/DZ Constraint Areas – BW13 (Return to [Figure 5-61](#))

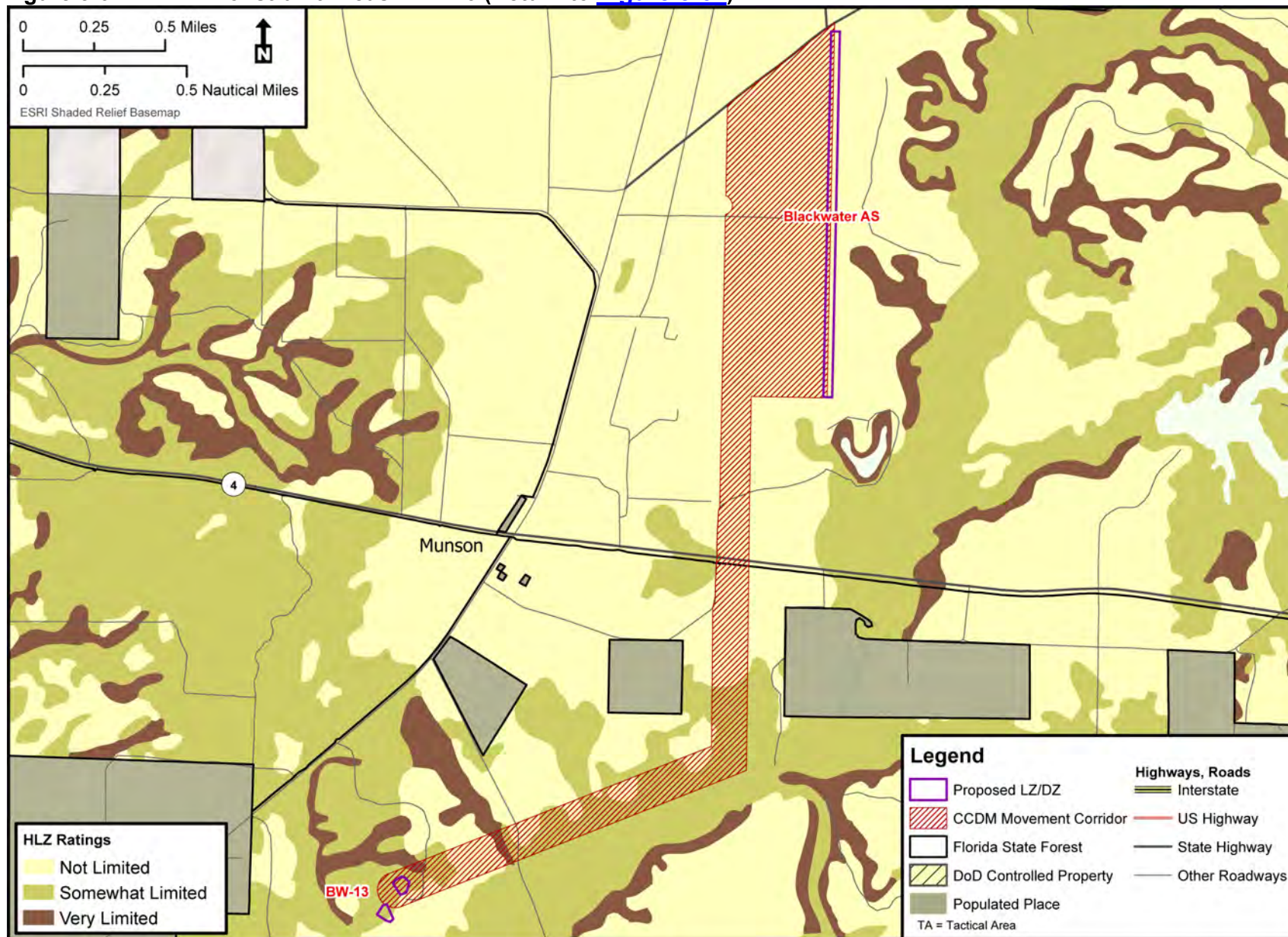


Figure 5-62. LZ/DZ Constraint Areas – BW14 (Return to [Figure 5-62](#))

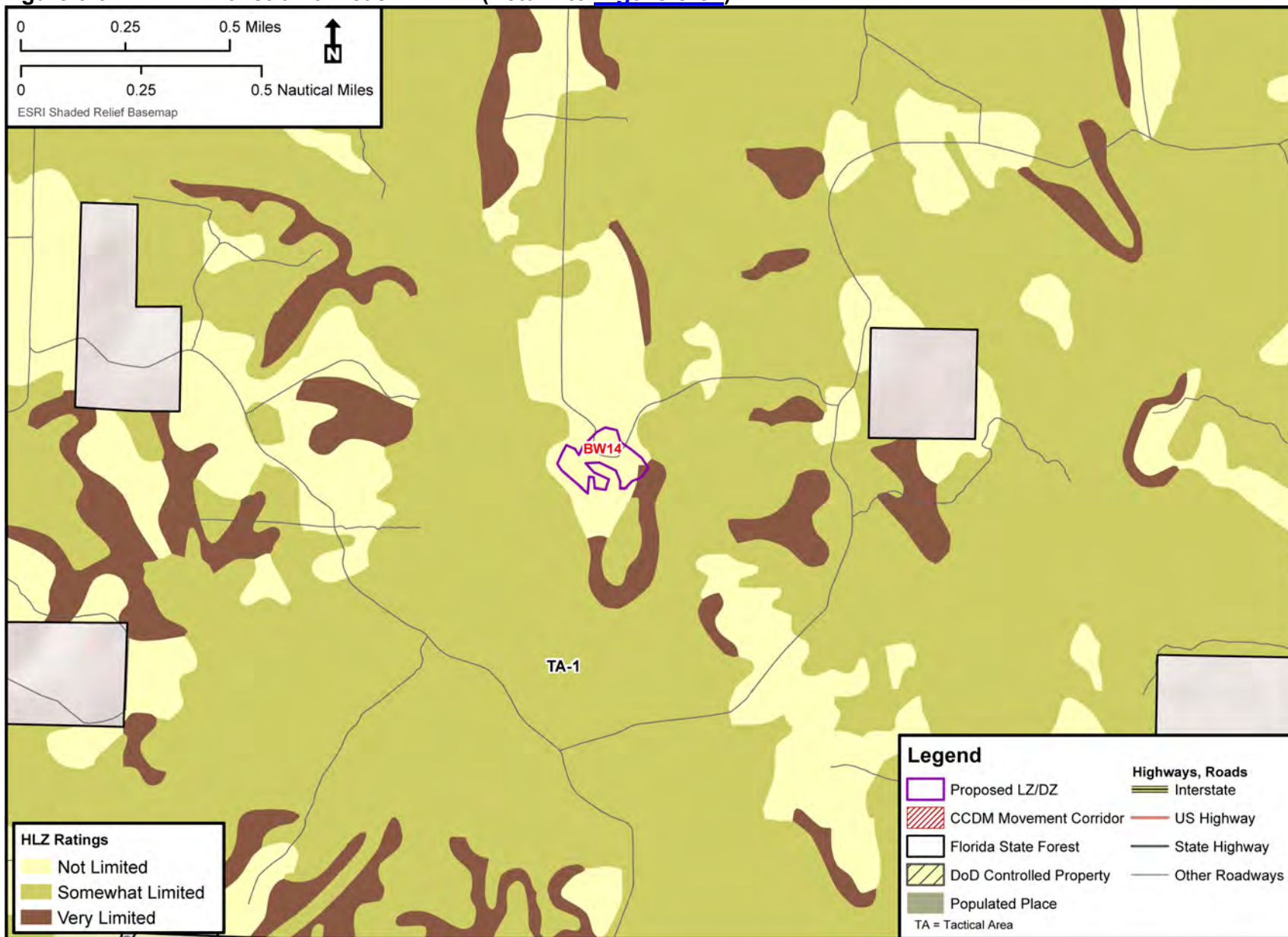




Figure 5-63. Water and Biological Resources at BRSF – Overview (Return to [Figure 5-63](#))

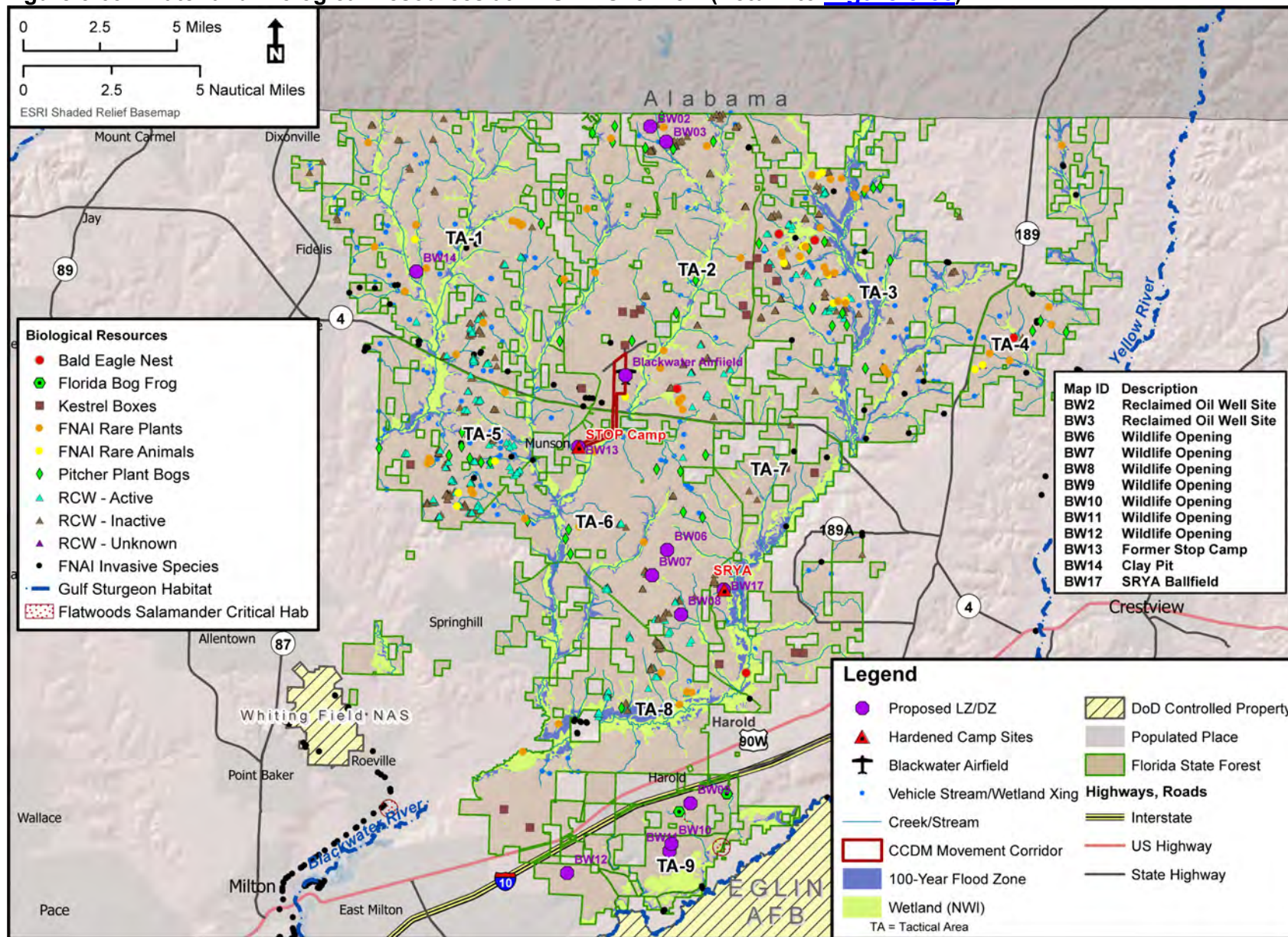




Figure 5-64. Water and Biological Resources – TA-1 at BRSF (Return to [Figure 5-64](#))

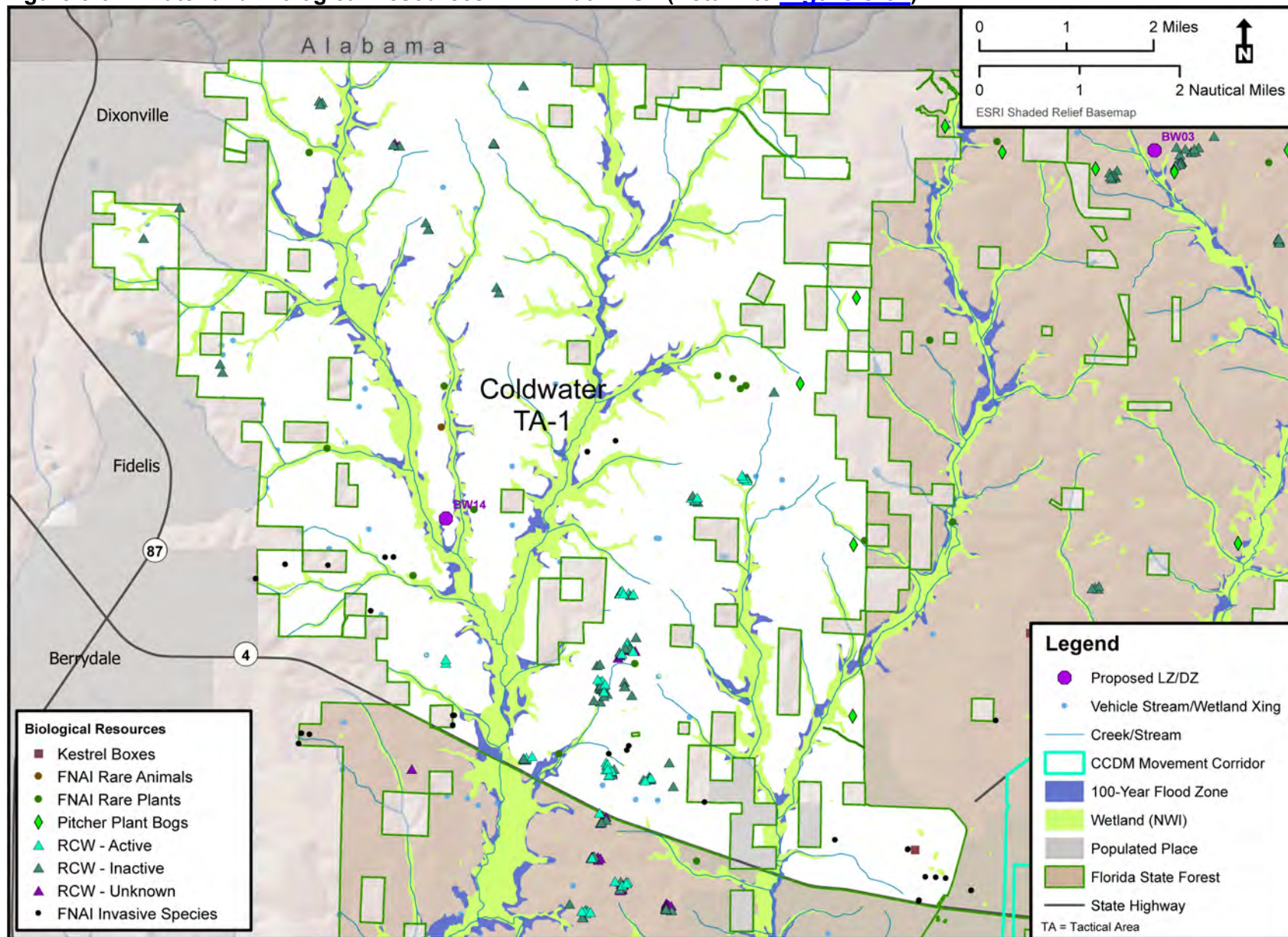




Figure 5-65. Water and Biological Resources – TA-2 at BRSF (Return to [Figure 5-65](#))

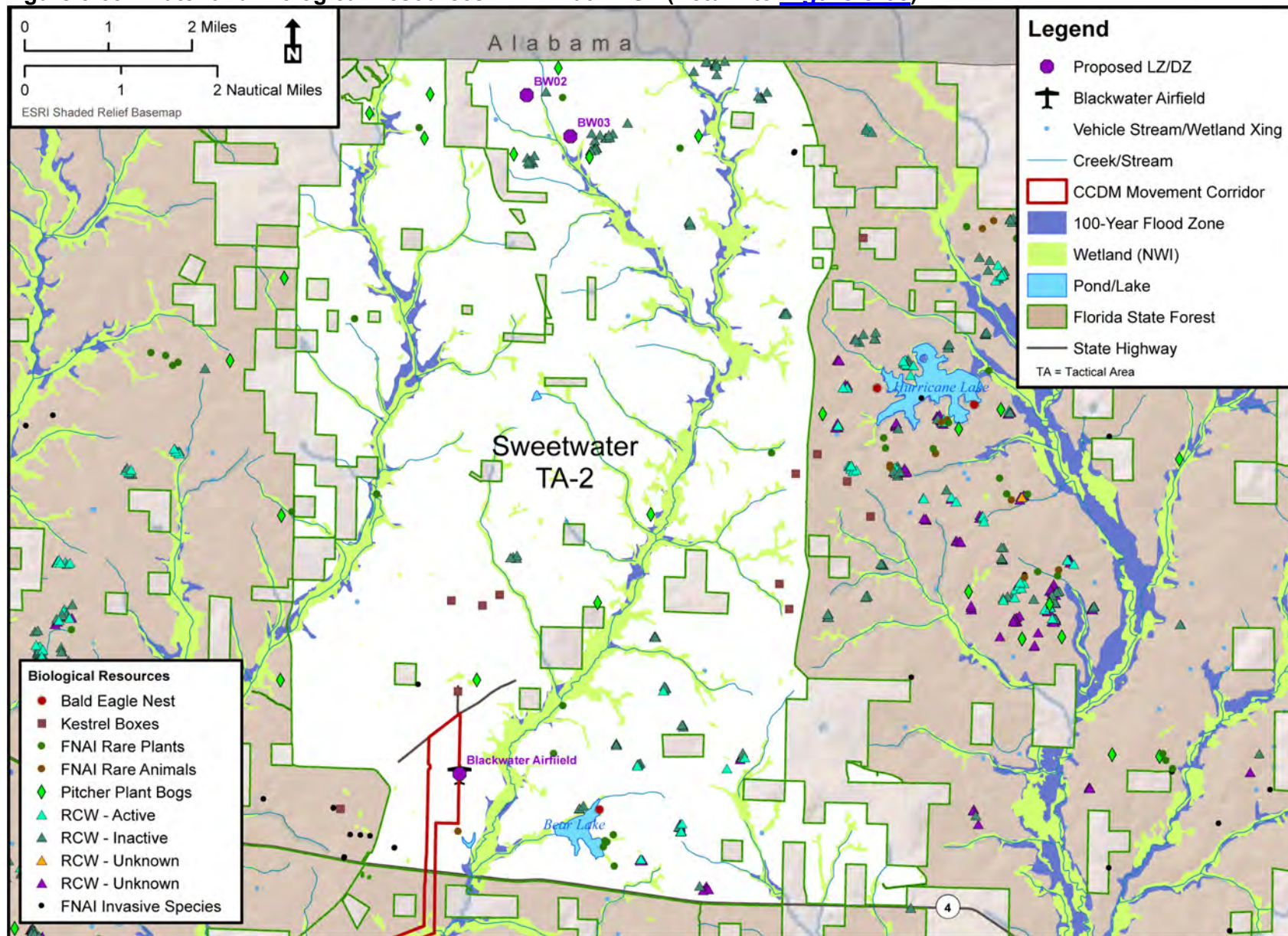




Figure 5-66. Water and Biological Resources – TA-3 at BRSF (Return to [Figure 5-66](#))

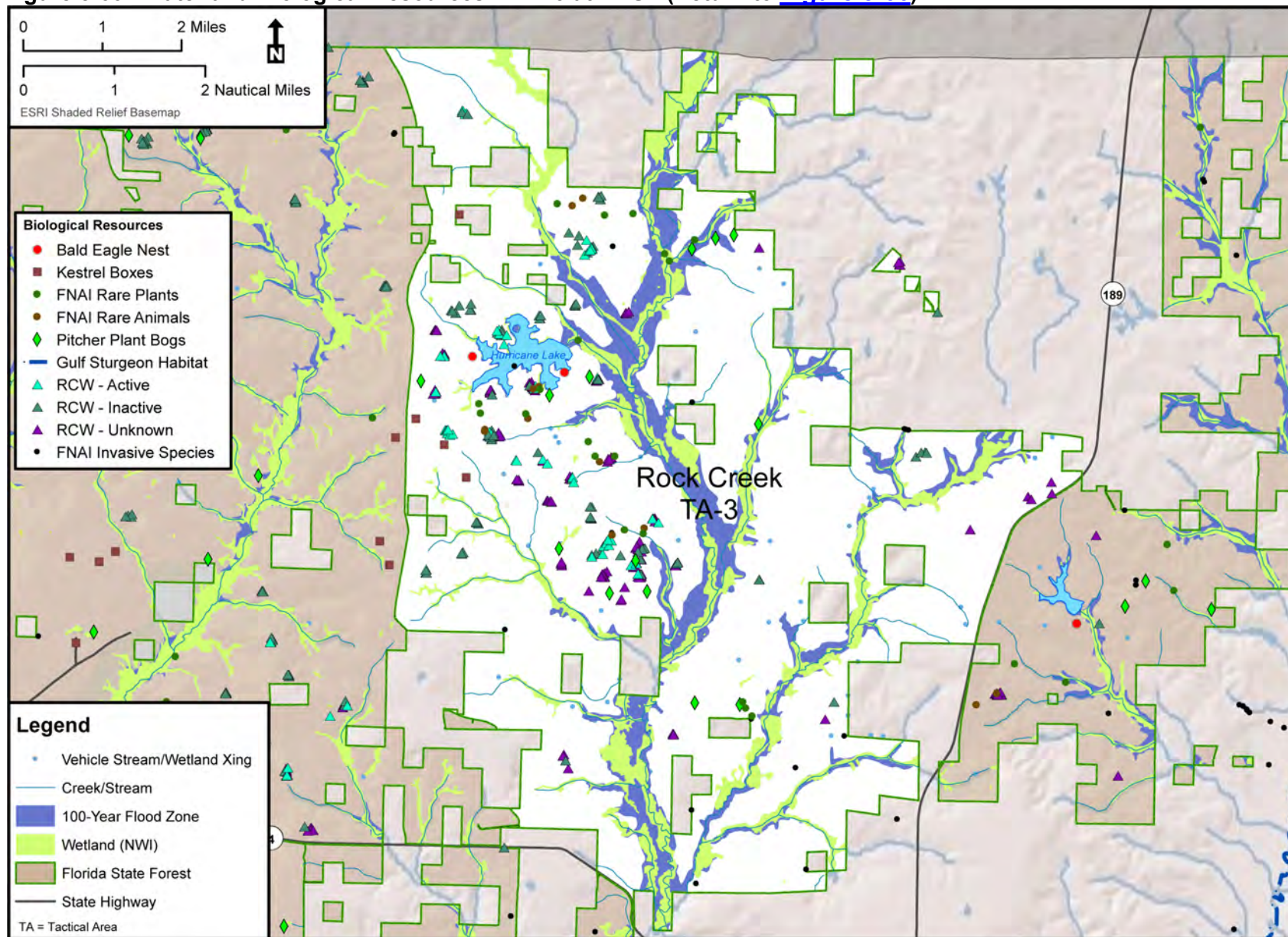




Figure 5-67. Water and Biological Resources – TA-4 at BRSF (Return to [Figure 5-67](#))

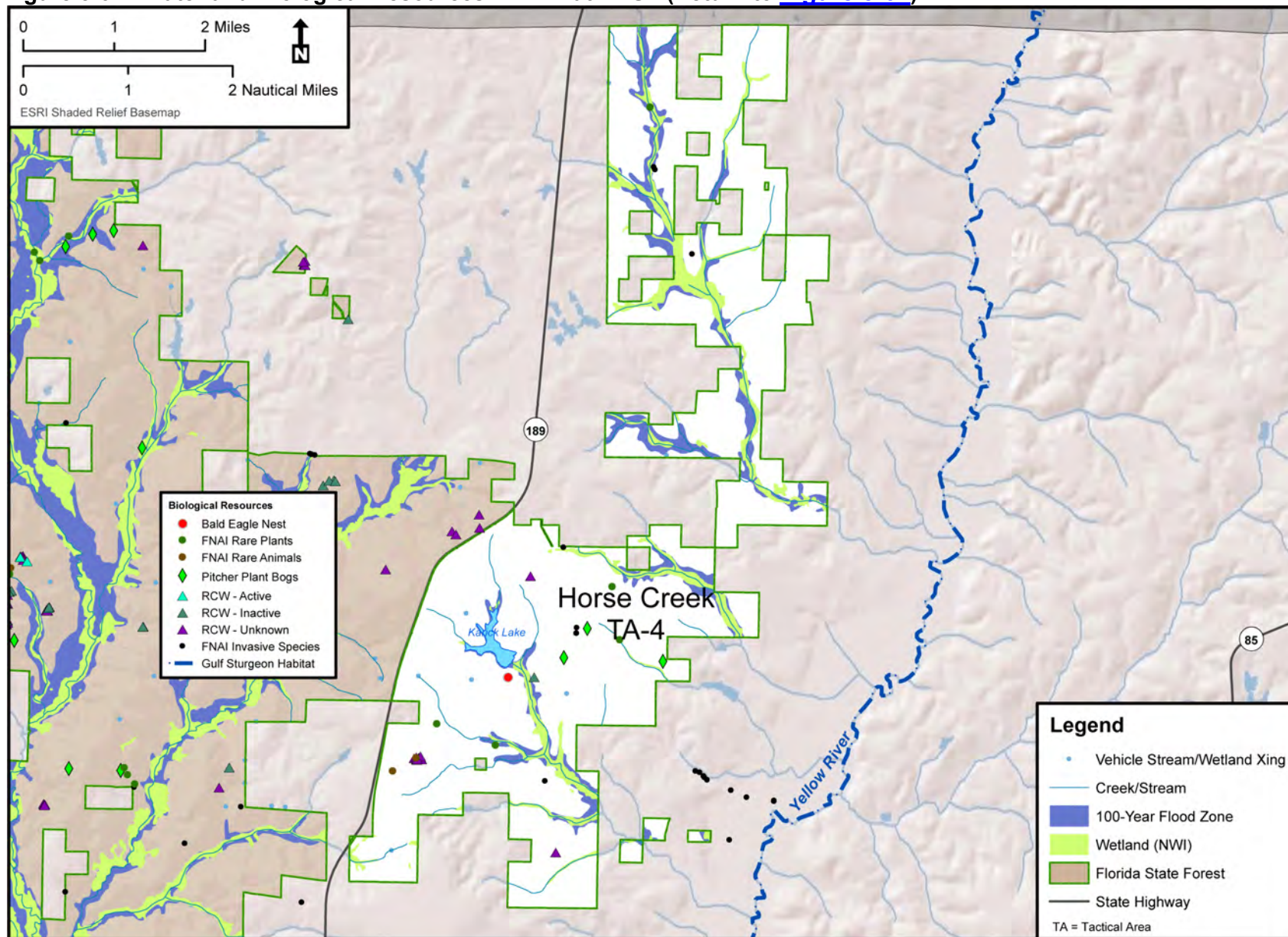
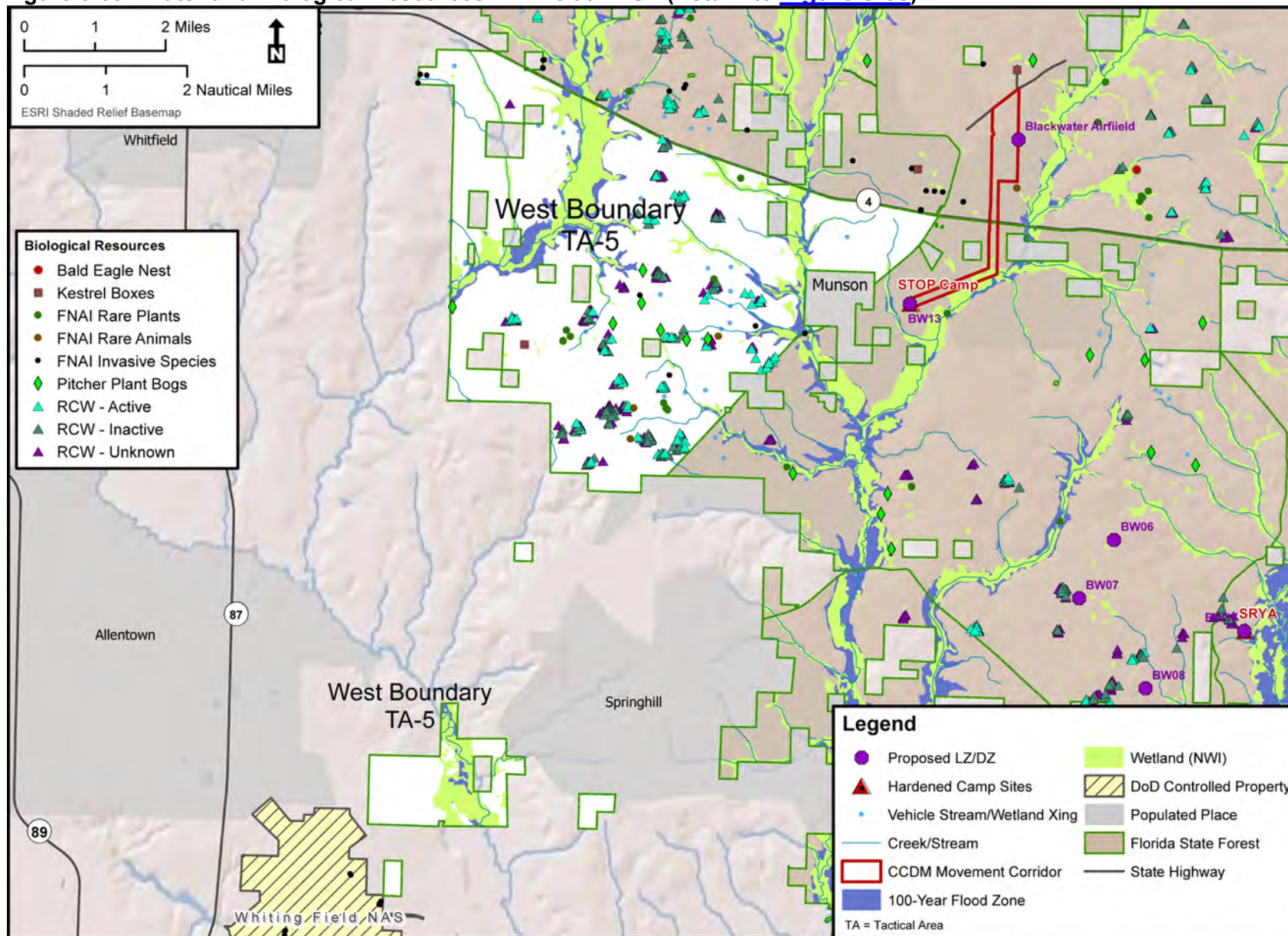




Figure 5-68. Water and Biological Resources – TA-5 at BRSF (Return to [Figure 5-68](#))





**Figure 5-69. Water and Biological Resources – TA-6 at BRSF (Return to [Figure 5-69](#))**

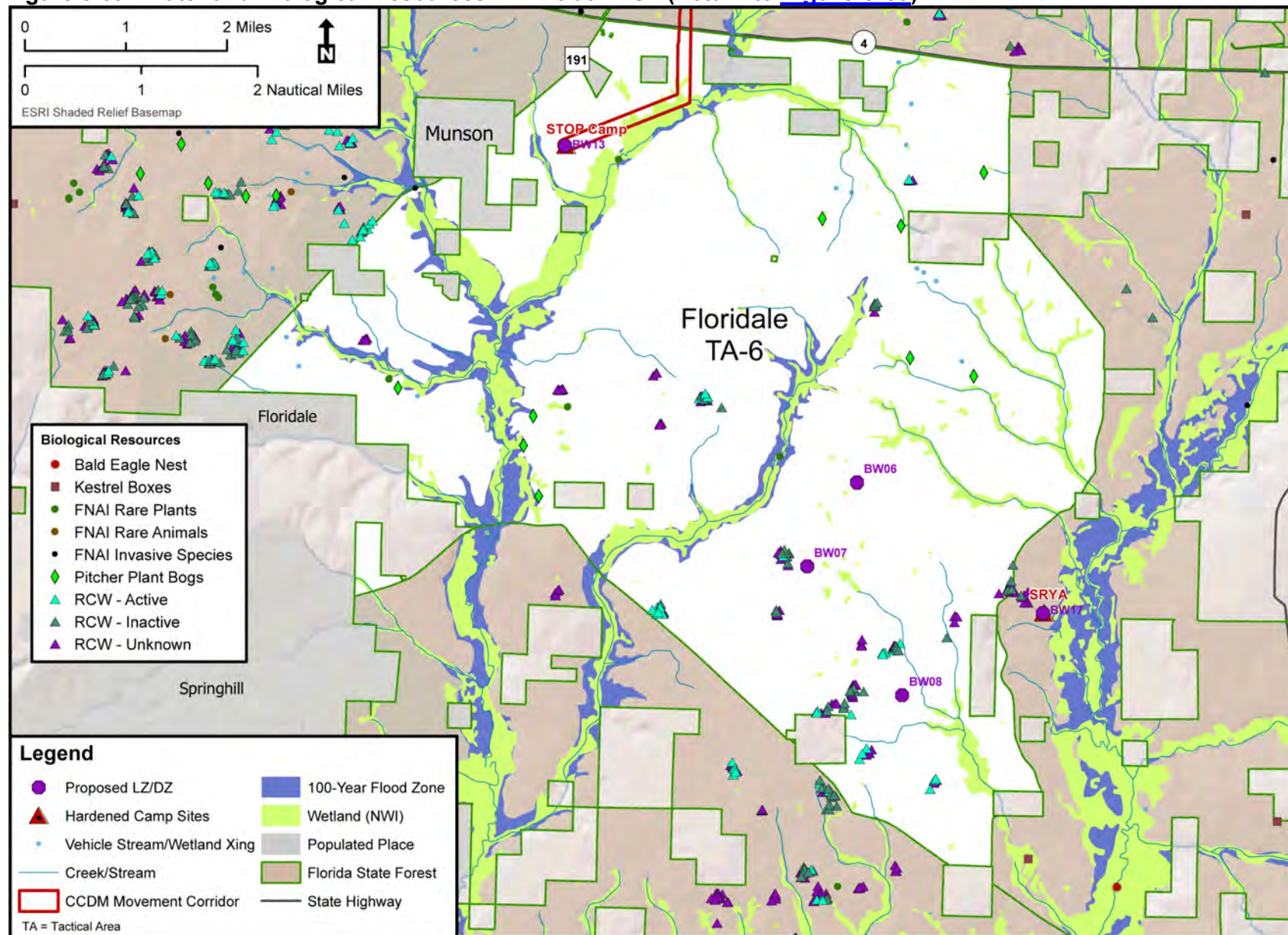
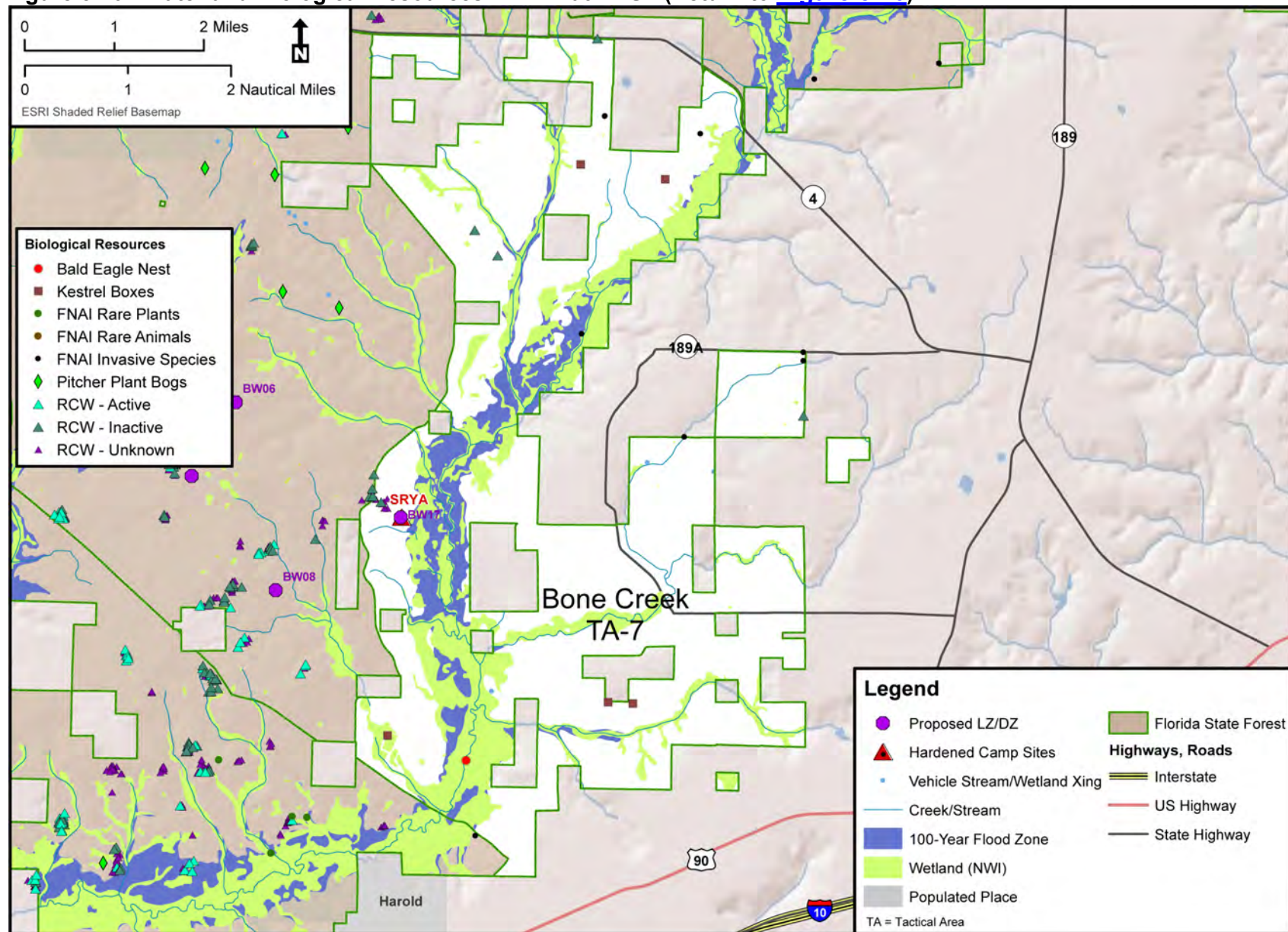




Figure 5-70. Water and Biological Resources – TA-7 at BRSF (Return to [Figure 5-70](#))





**Figure 5-71. Water and Biological Resources – TA-8 at BRSF (Return to [Figure 5-71](#))**

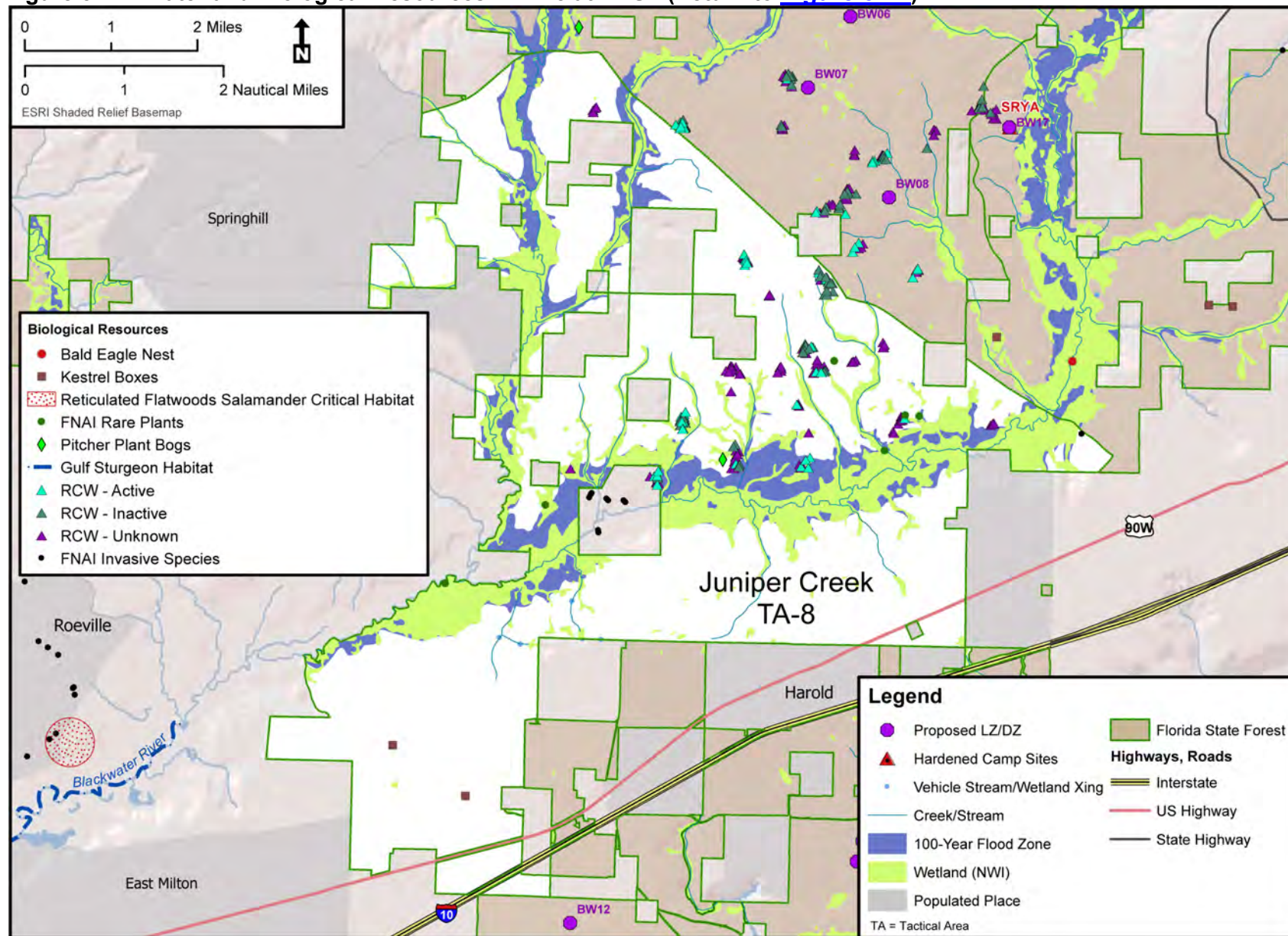
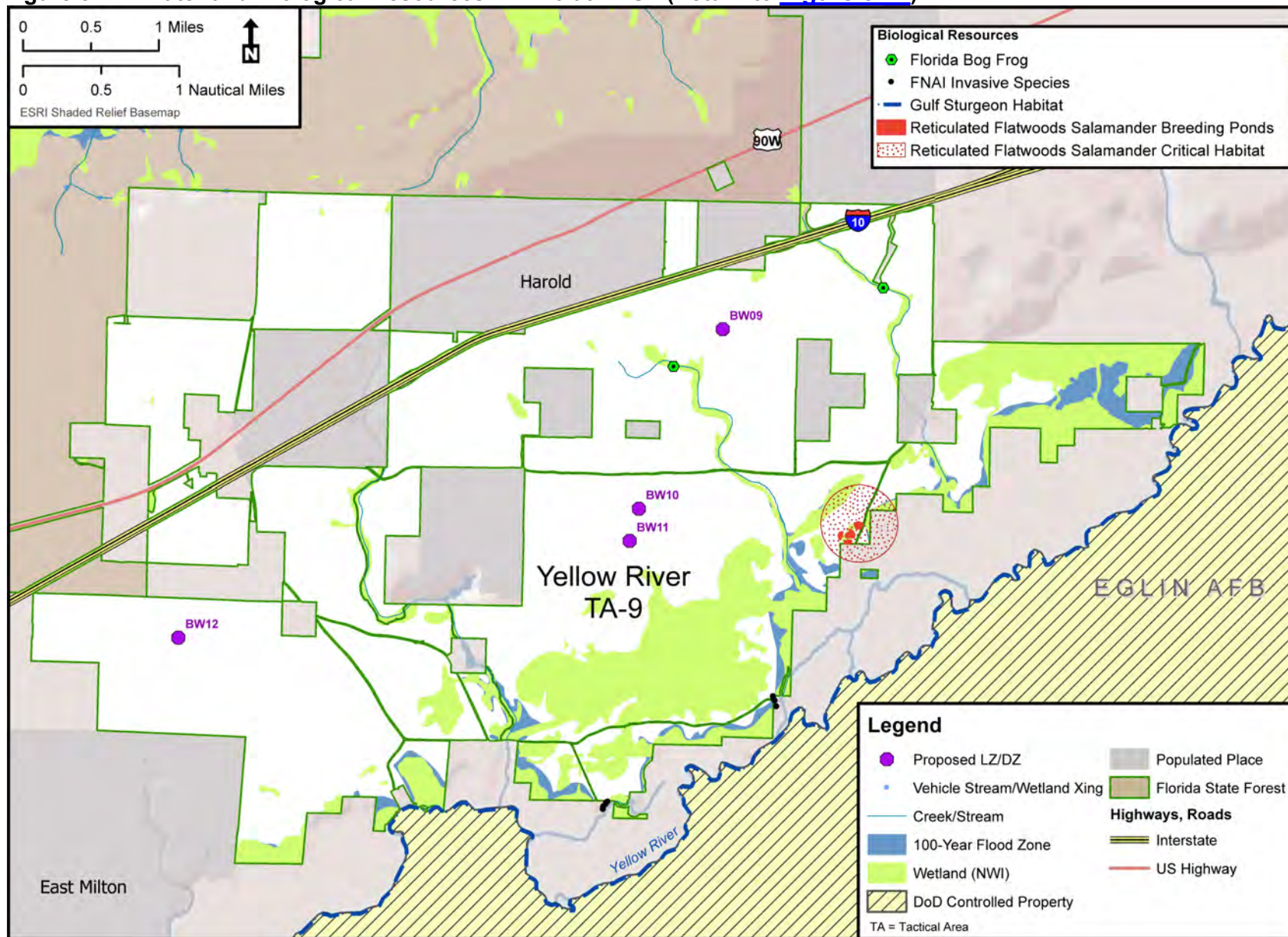




Figure 5-72. Water and Biological Resources – TA-9 at BRSF (Return to [Figure 5-72](#))





**Figure 5-73. BRSF Water and Biological Resources – BW2 & BW3 (Return to [Figure 5-73](#))**

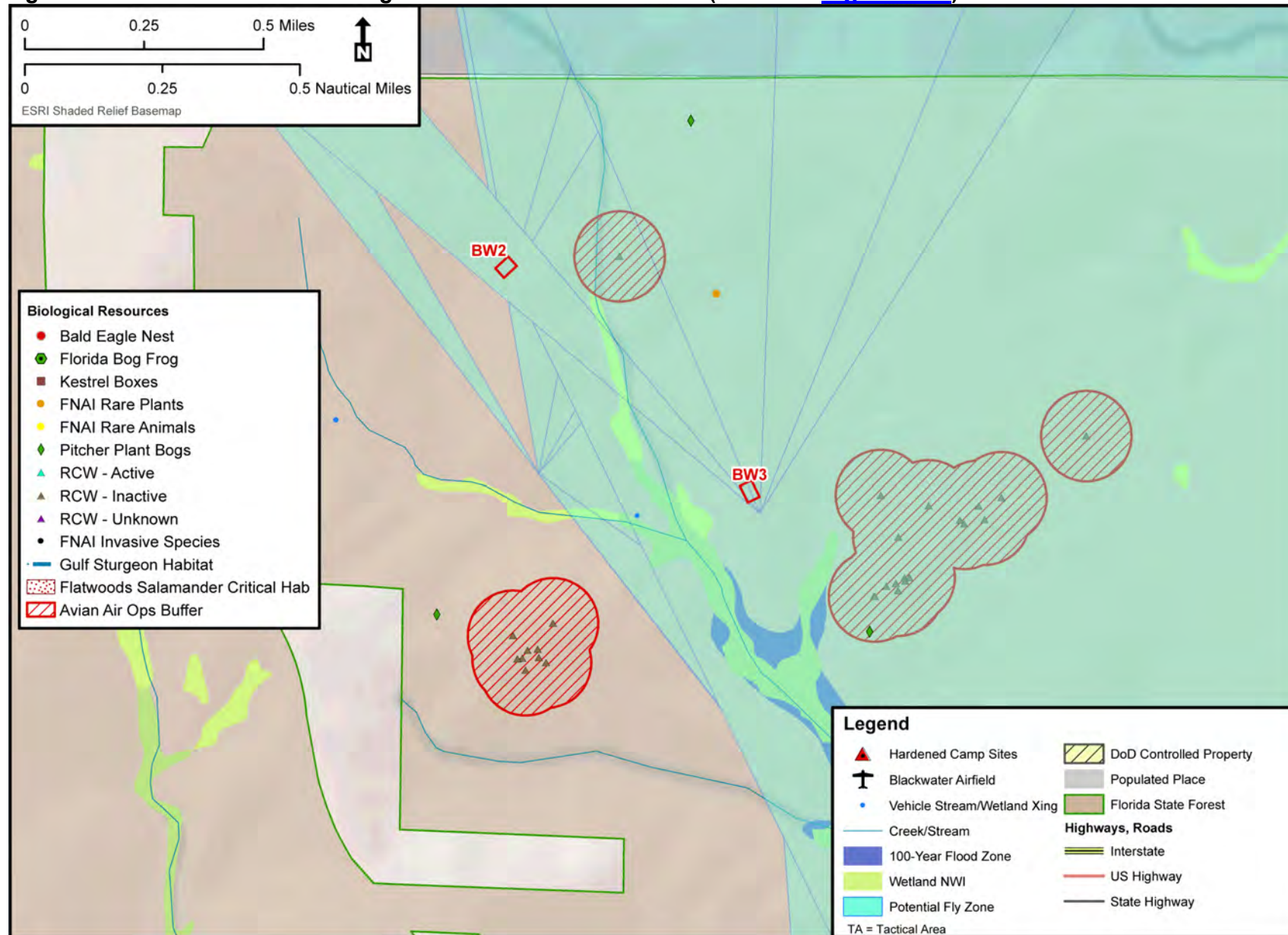
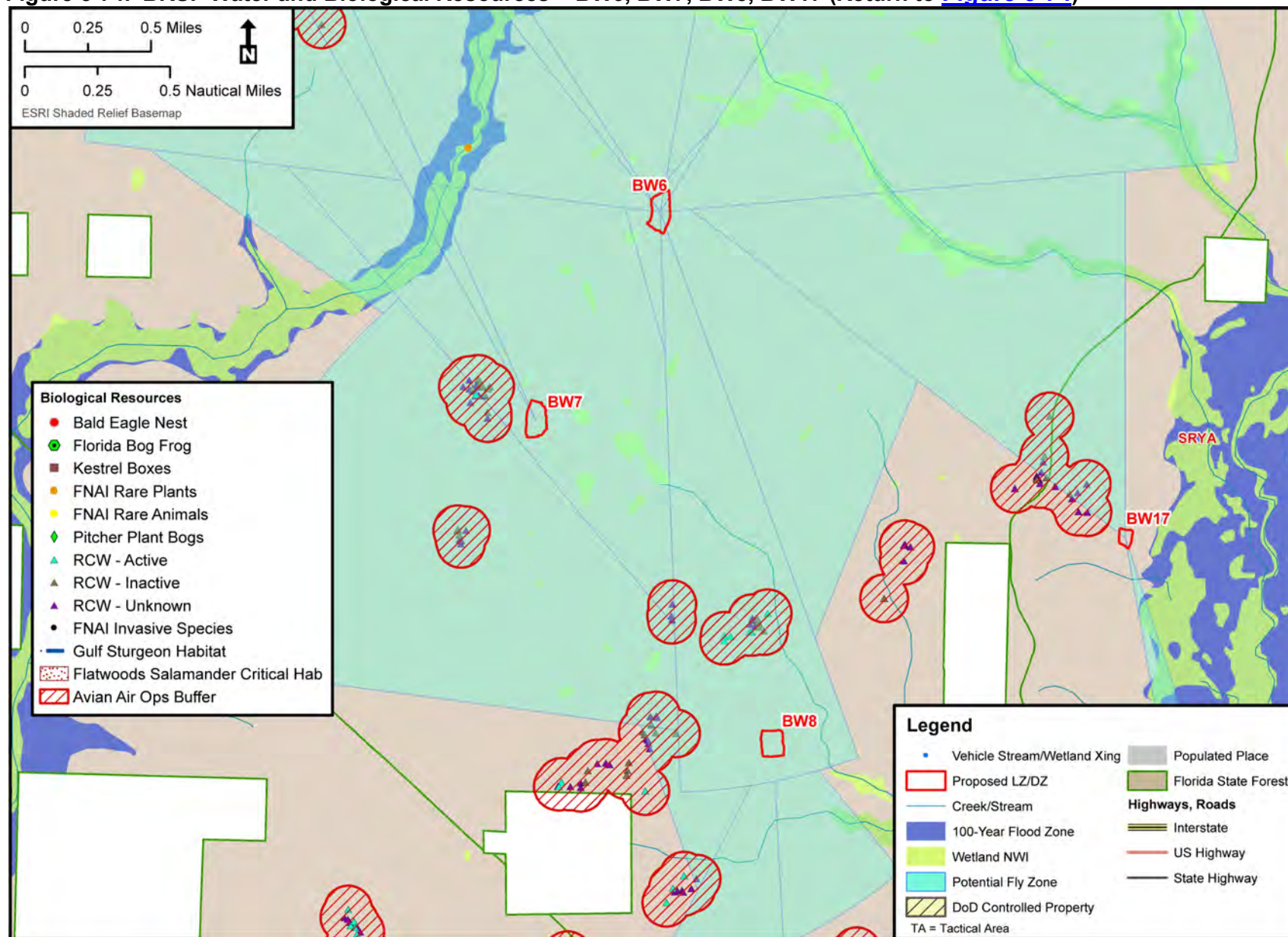


Figure 5-74. BRSF Water and Biological Resources – BW6, BW7, BW8, BW17 (Return to [Figure 5-74](#))





**Figure 5-75. BRSF Water and Biological Resources – BW9, BW10, BW11, BW12 (Return to [Figure 5-75](#))**

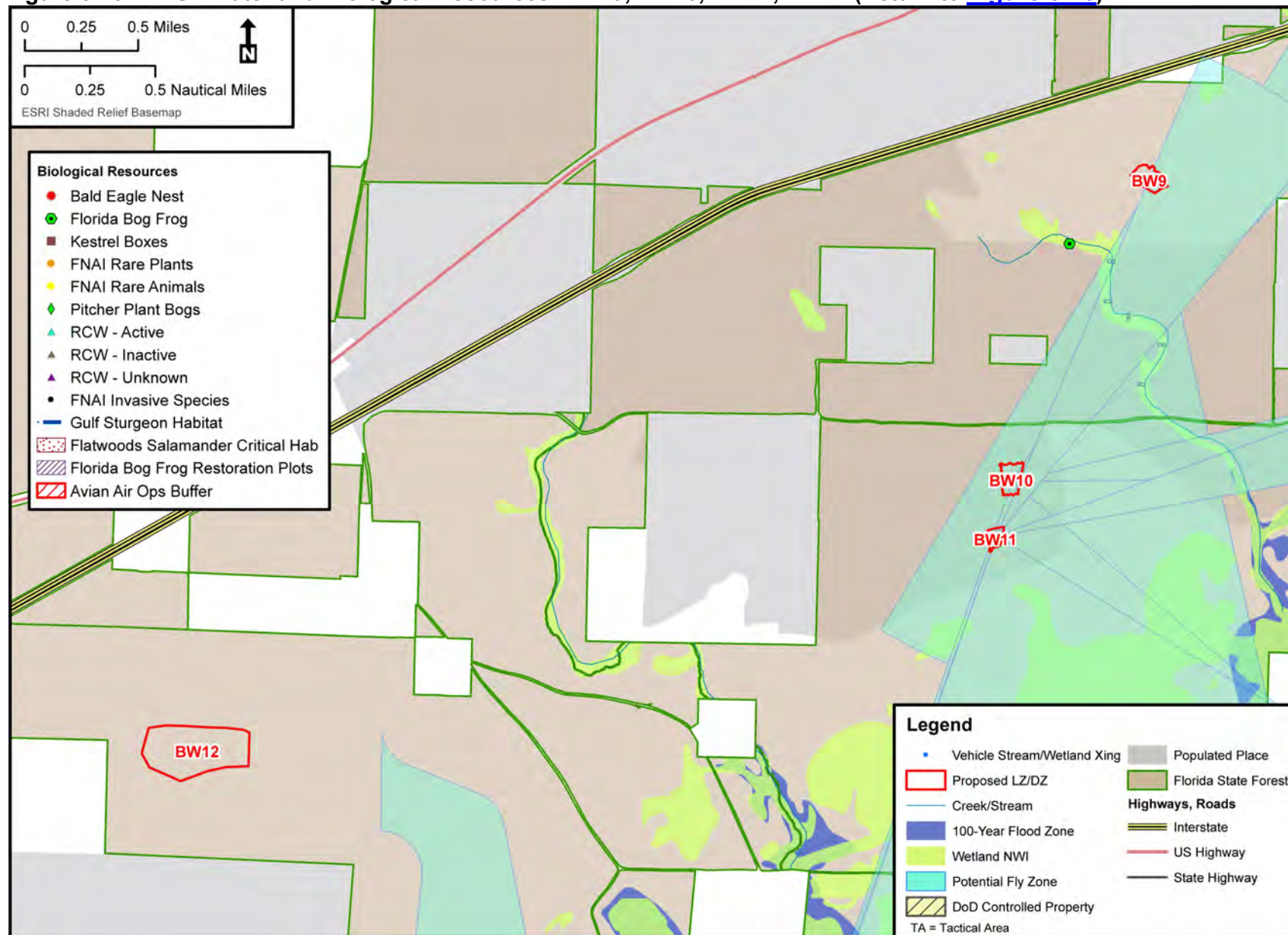


Figure 5-76. BRSF Water and Biological Resources – BW13 and Movement Corridor (Return to [Figure 5-76](#))

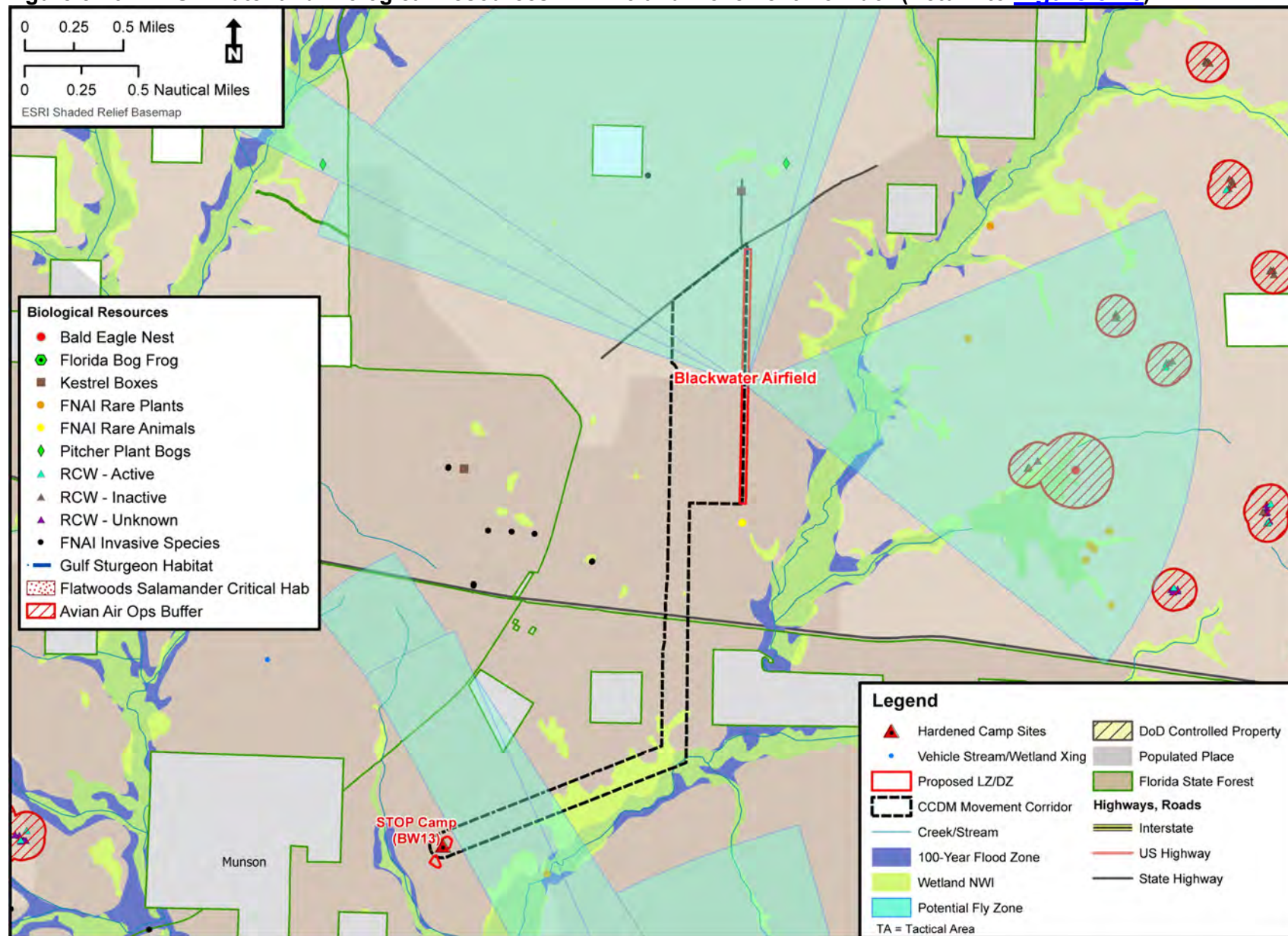




Figure 5-77. BRSF Water and Biological Resources – BW14 (Return to [Figure 5-77](#))

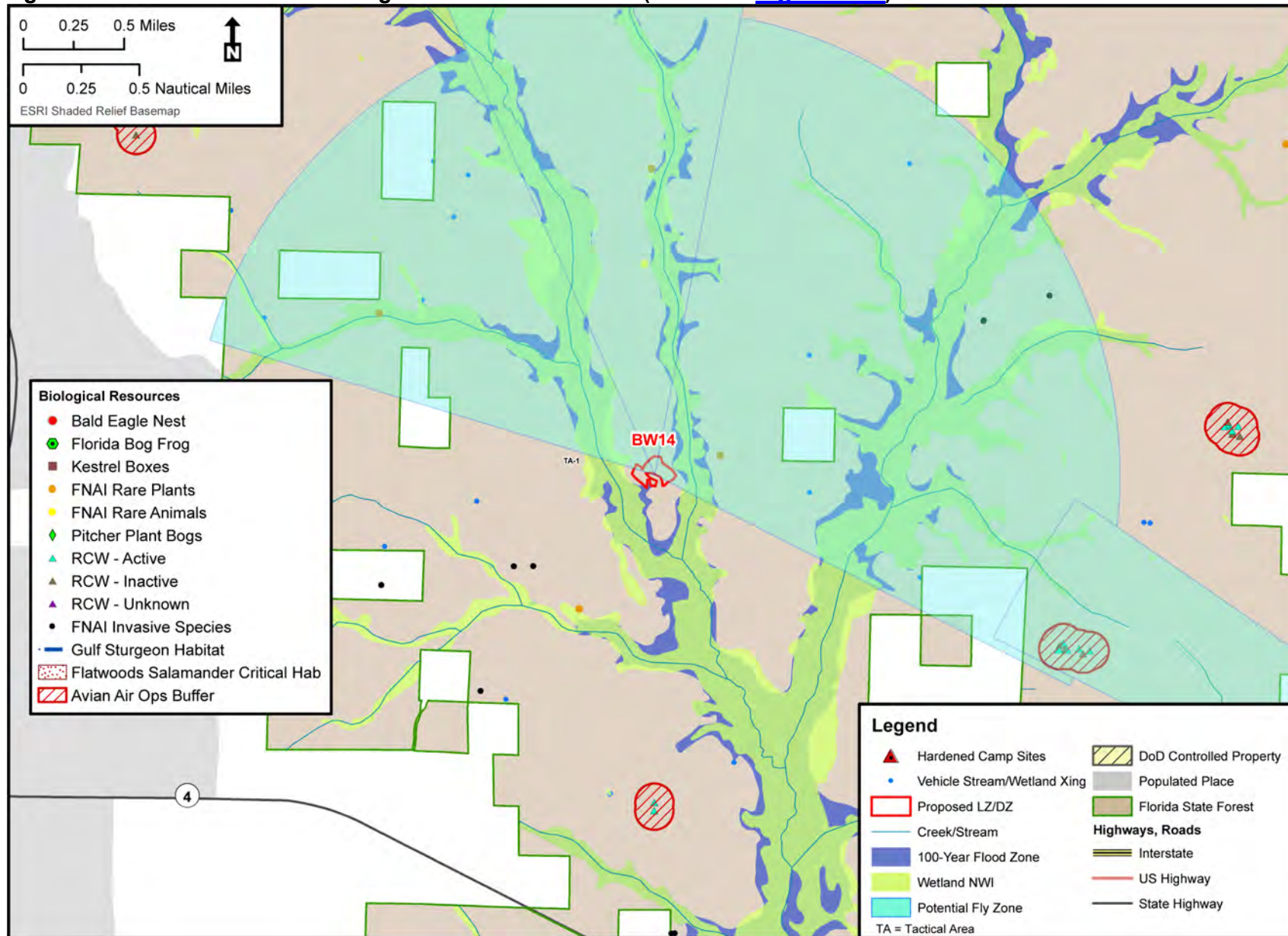


Figure 5-78. Cultural Resource Survey in BRSF (Return to [Figure 5-78](#))

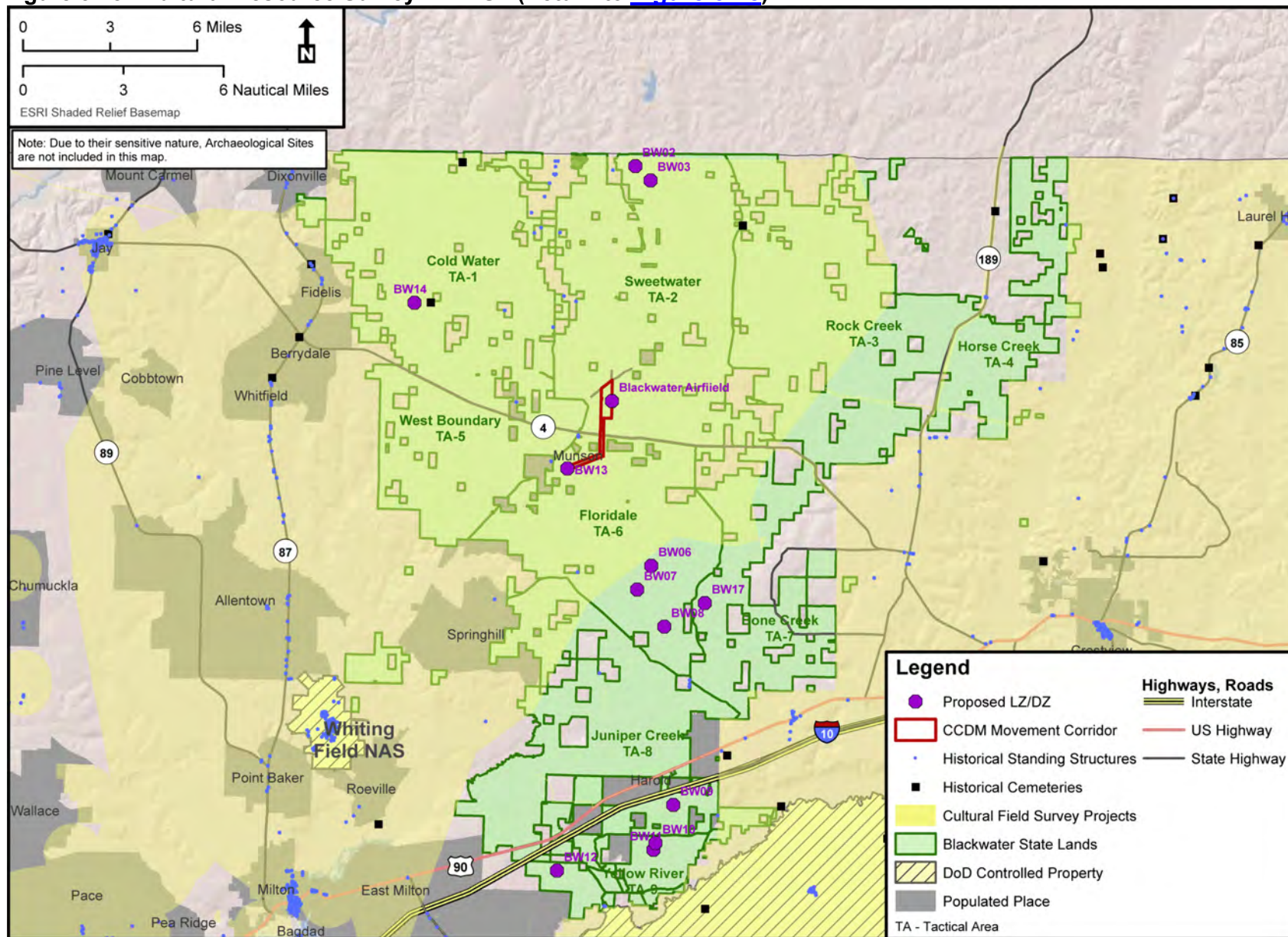




Figure 5-79. Land Use Types at BRSF (Return to [Figure 5-79](#))

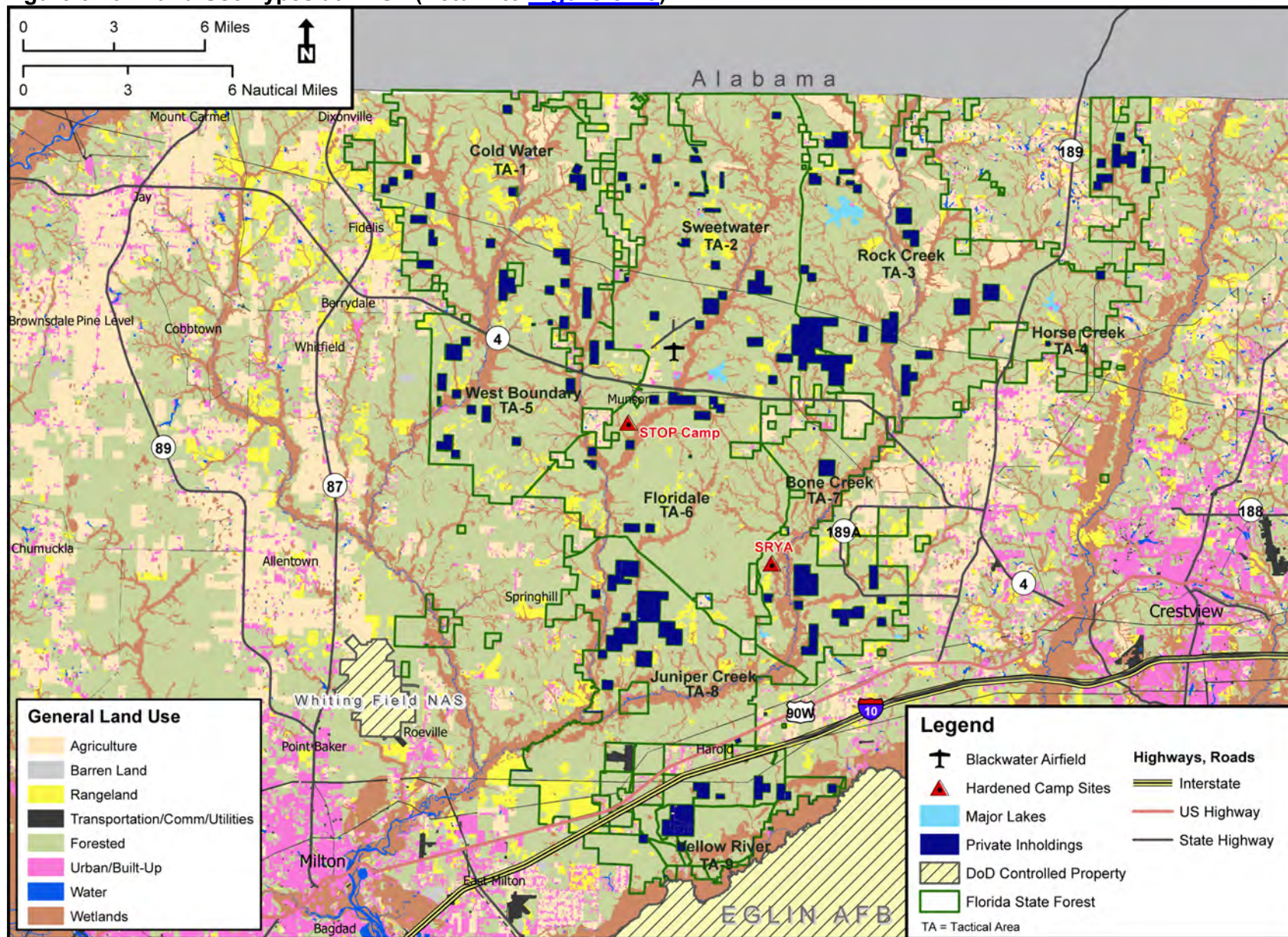




Figure 5-80. BRSF Recreation and Hunting Areas (Return to [Figure 5-80](#))

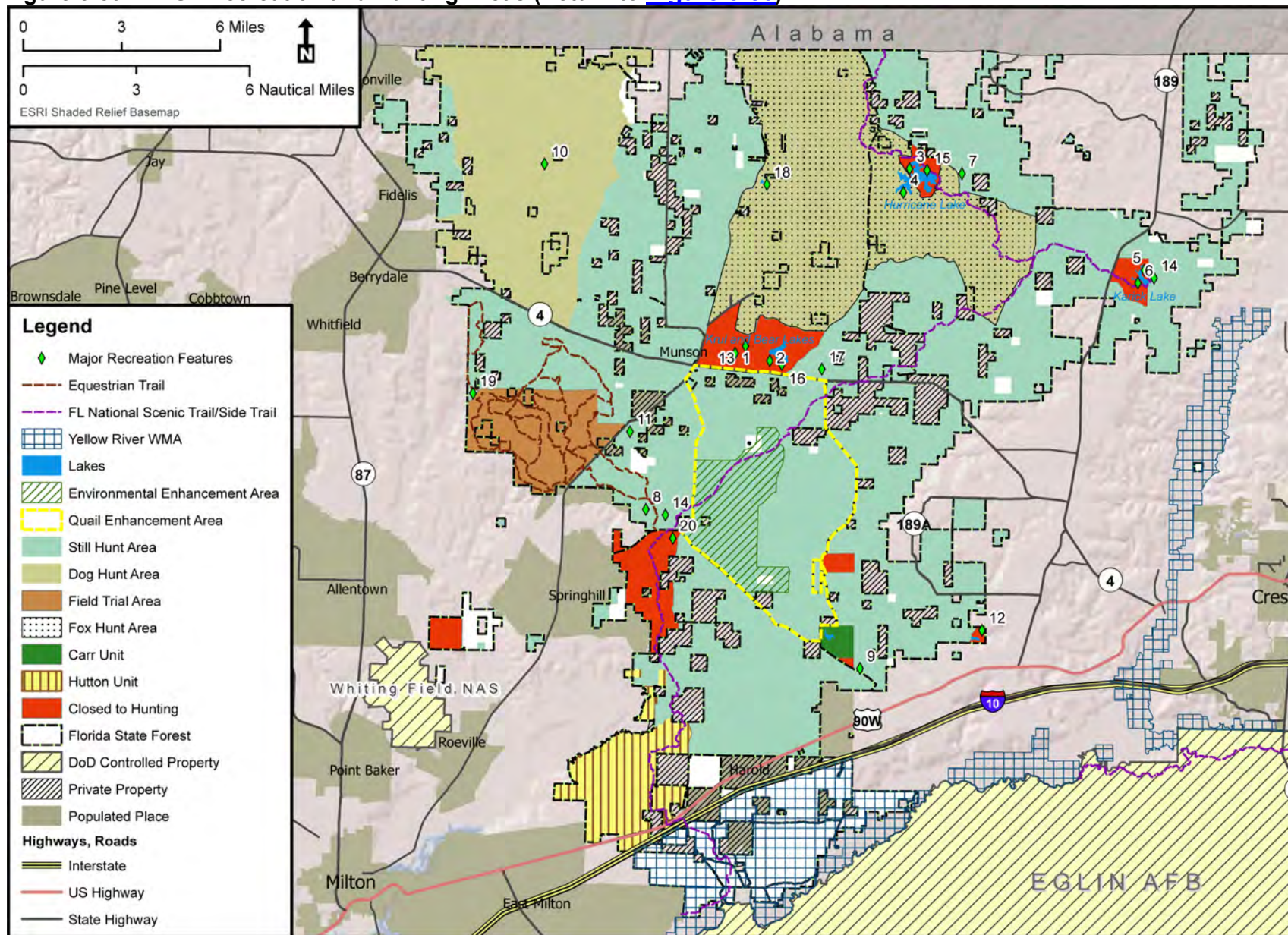




Figure 5-81. Environmental Justice Areas of Concern Near BRSF (Return to [Figure 5-81](#))

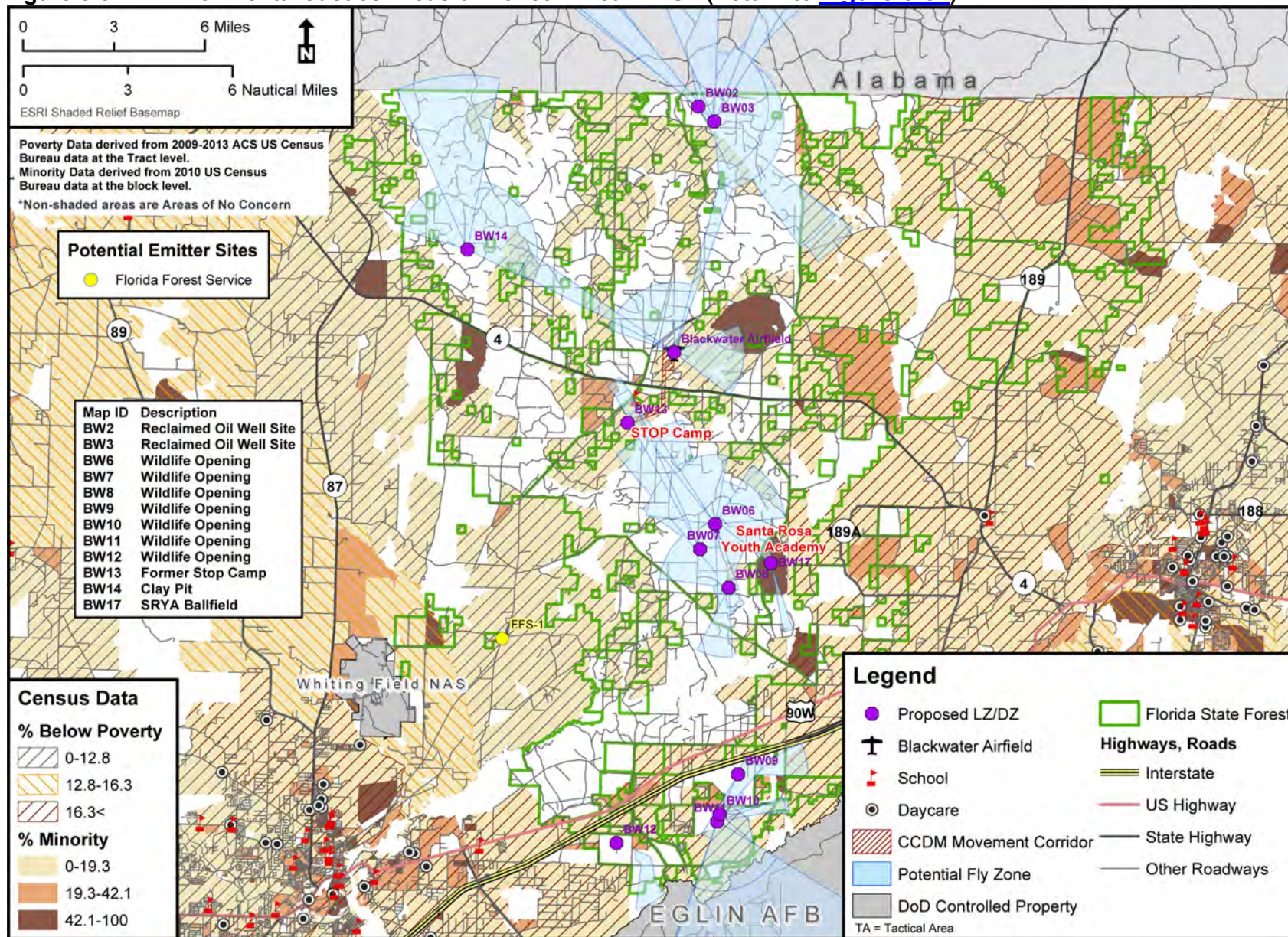




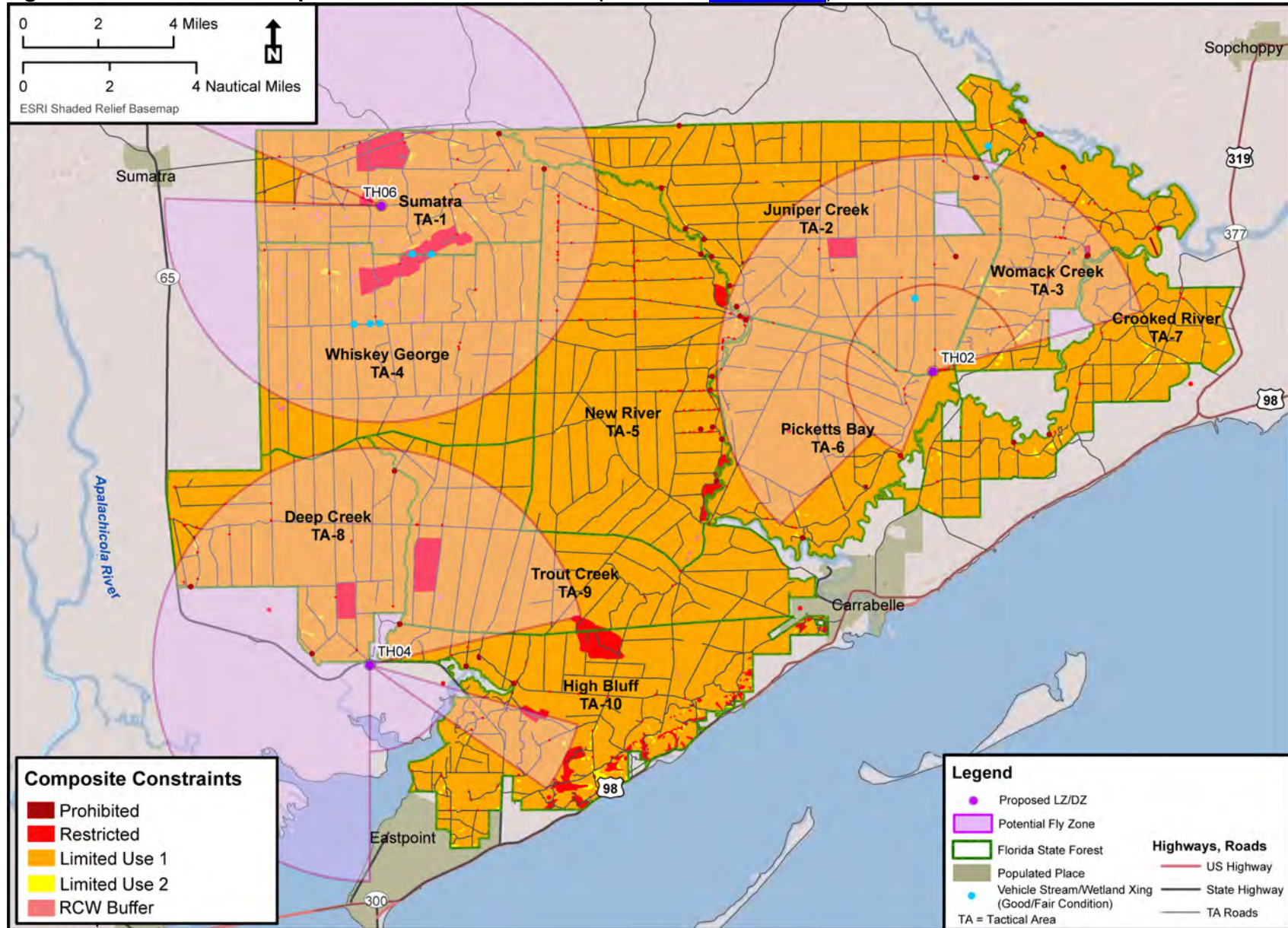
Figure 6-1. THSF Ground Operations Protection Levels (Return to [Figure 6-1](#))

Figure 6-2. THSF TA-1 Ground Operations Protection Levels (Return to [Figure 6-2](#))

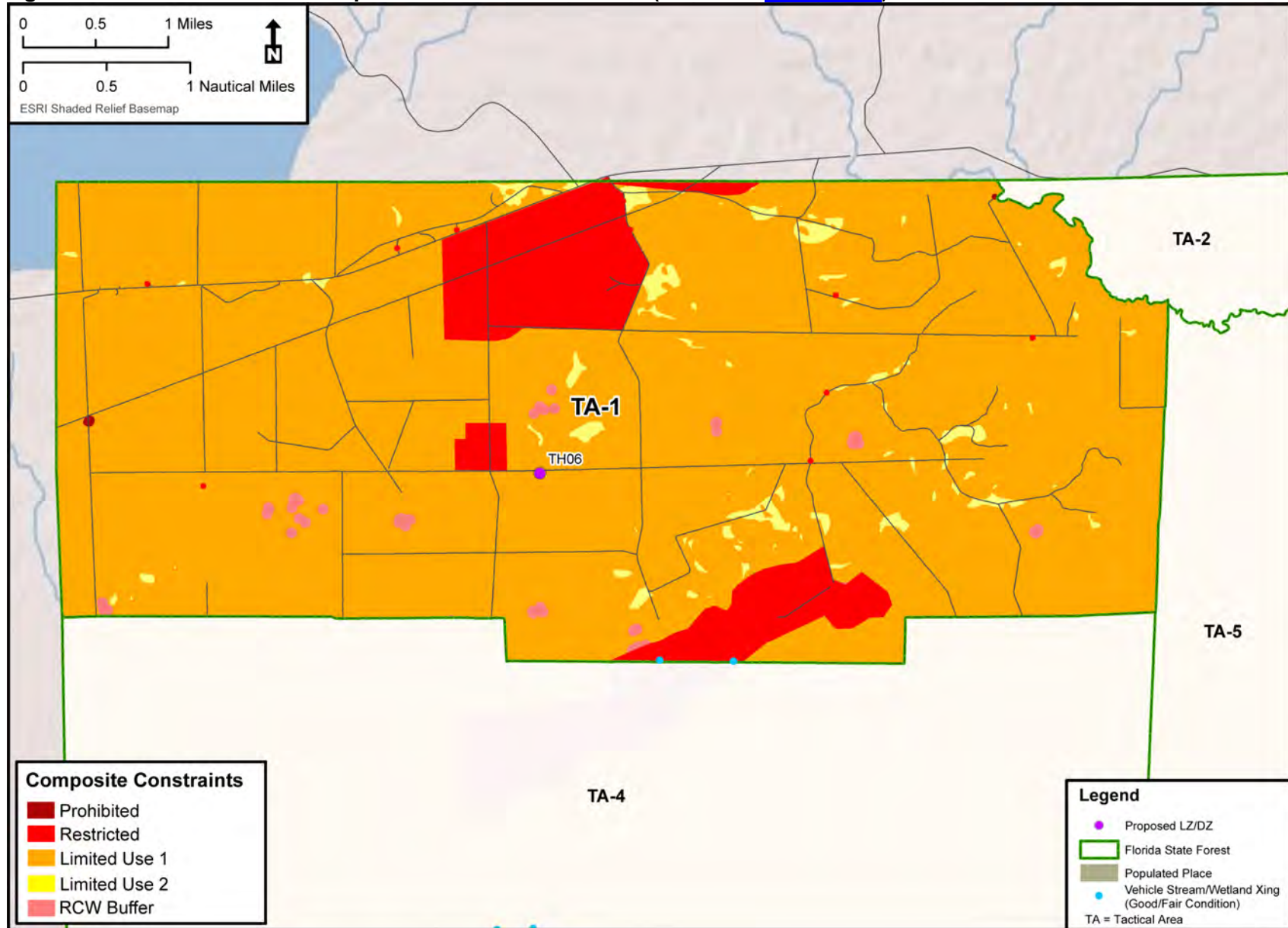




Figure 6-3. THSF TA-2 Ground Operations Protection Levels (Return to [Figure 6-3](#))

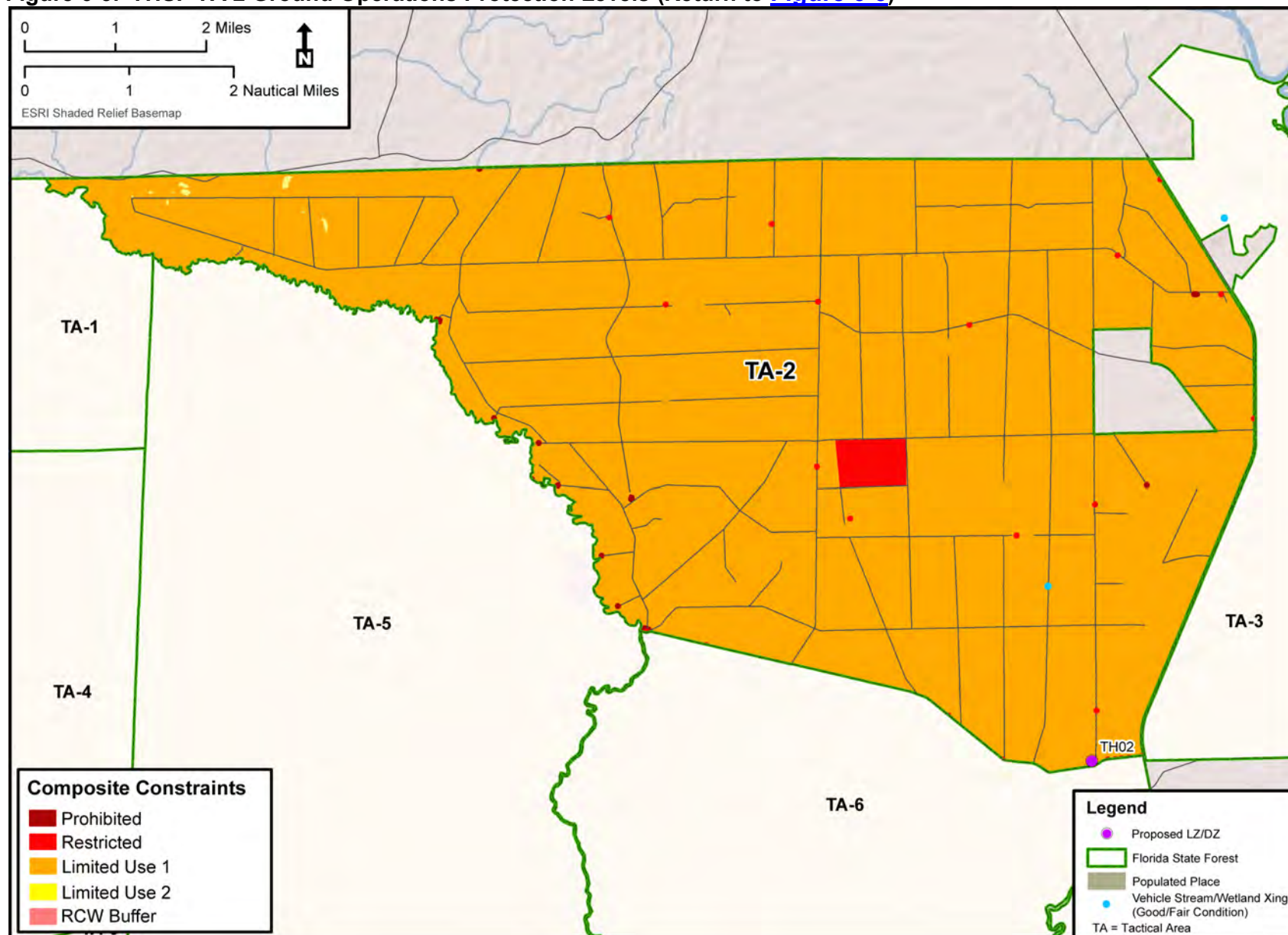




Figure 6-4. THSF TA-3 Ground Operations Protection Levels (Return to [Figure 6-4](#))

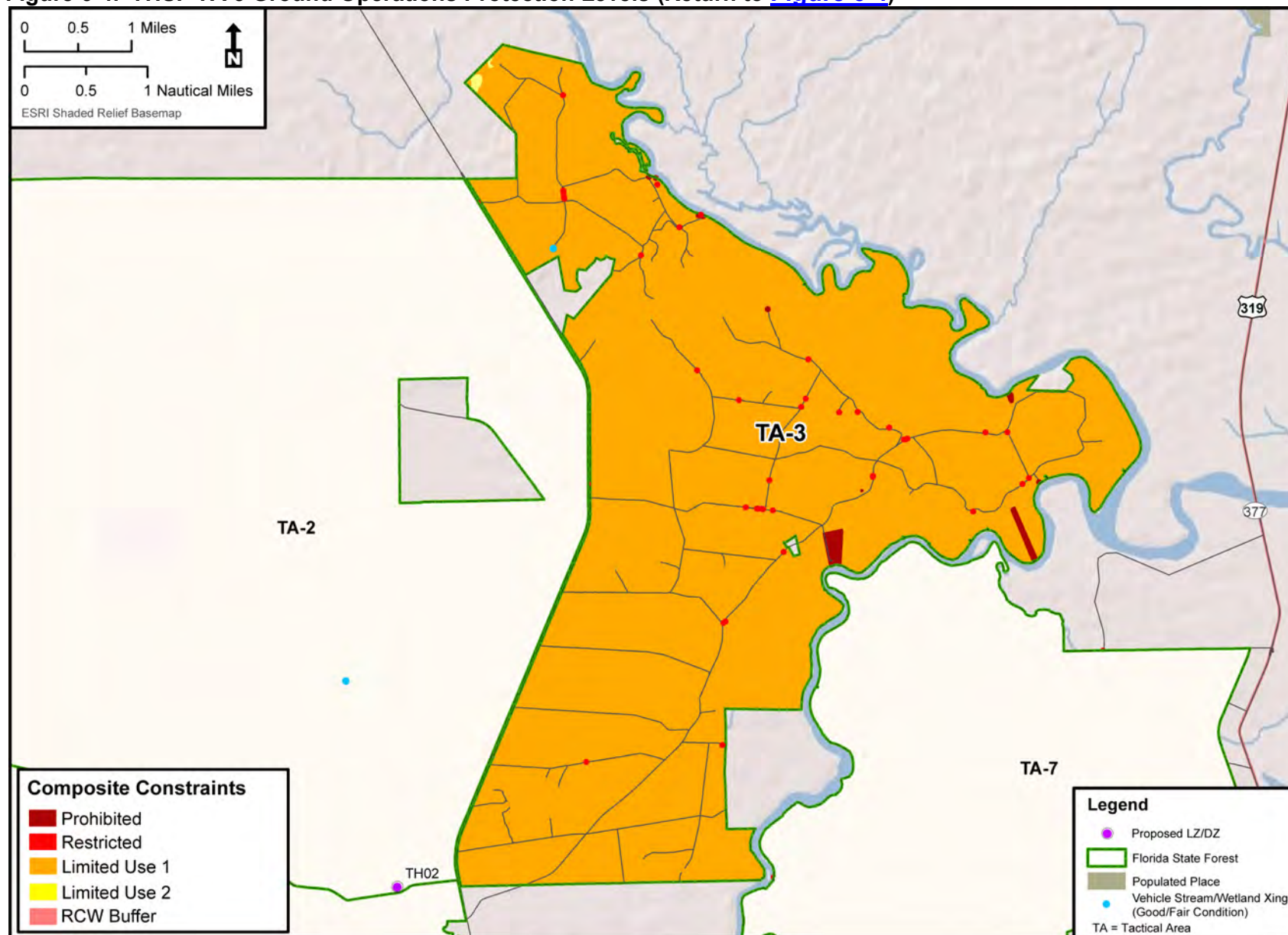


Figure 6-5. THSF TA-4 Ground Operations Protection Levels (Return to [Figure 6-5](#))

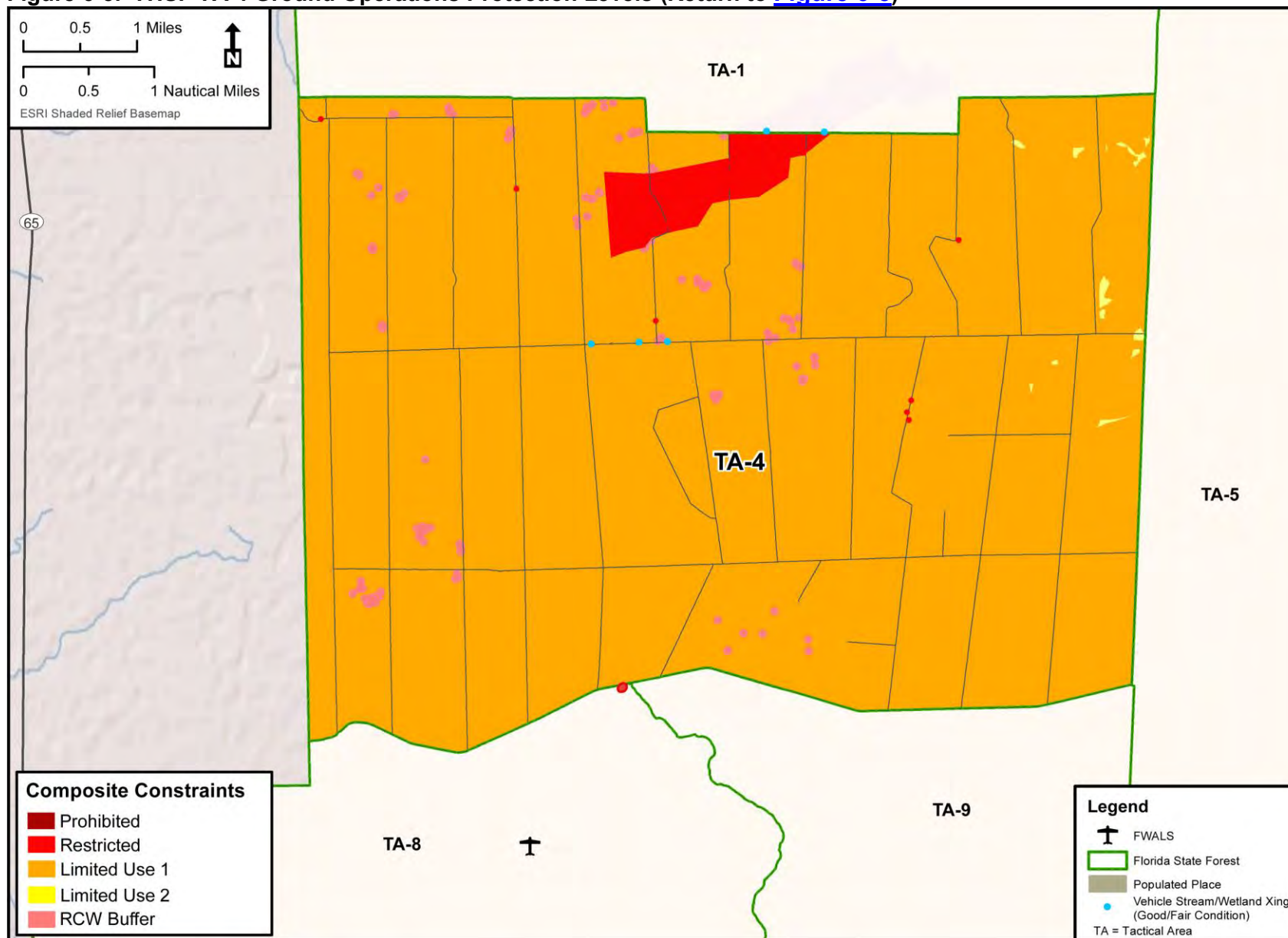


Figure 6-6. THSF TA-5 Ground Operations Protection Levels (Return to [Figure 6-6](#))

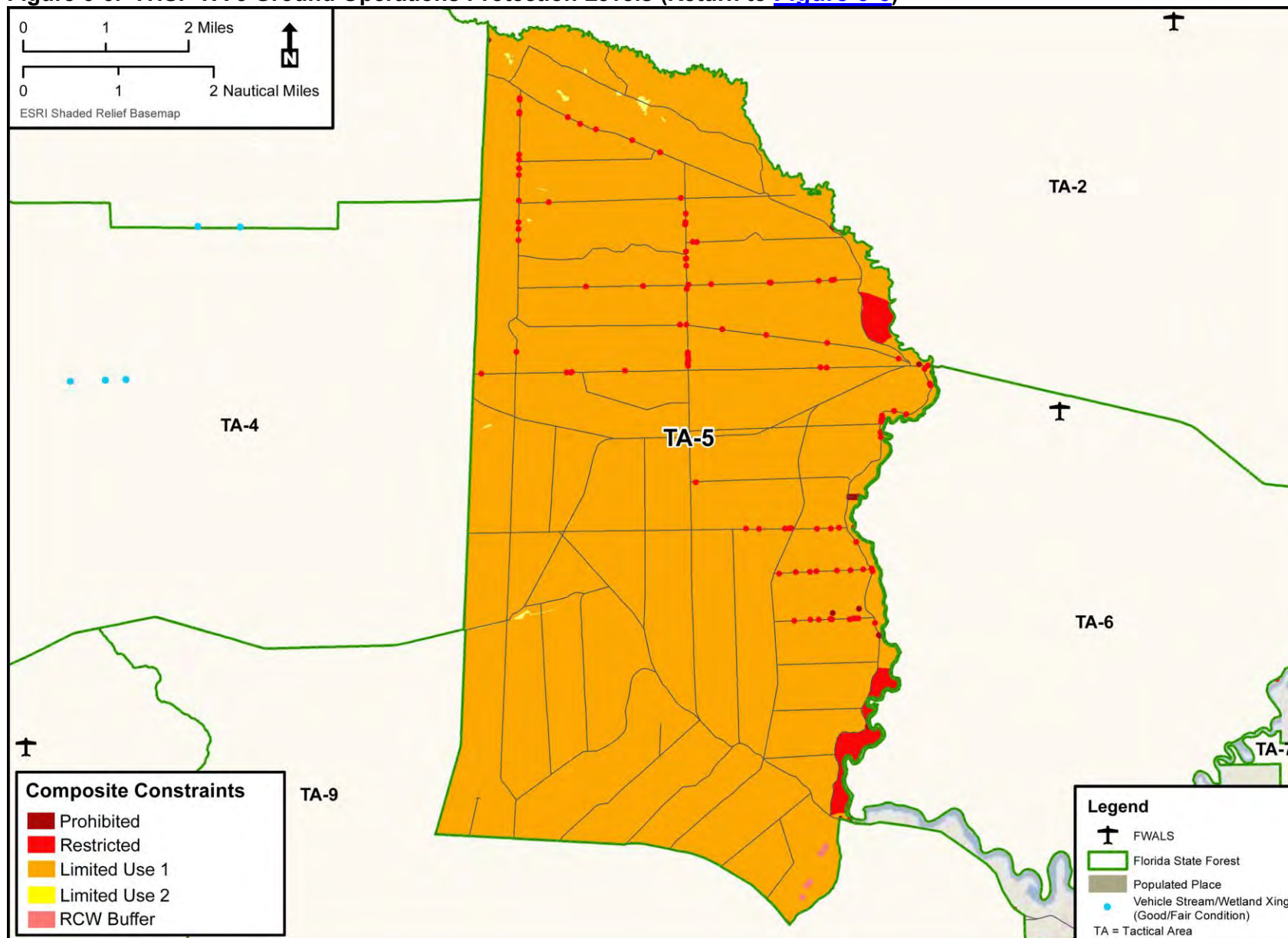




Figure 6-7. THSF TA-6 Ground Operations Protection Levels (Return to [Figure 6-7](#))

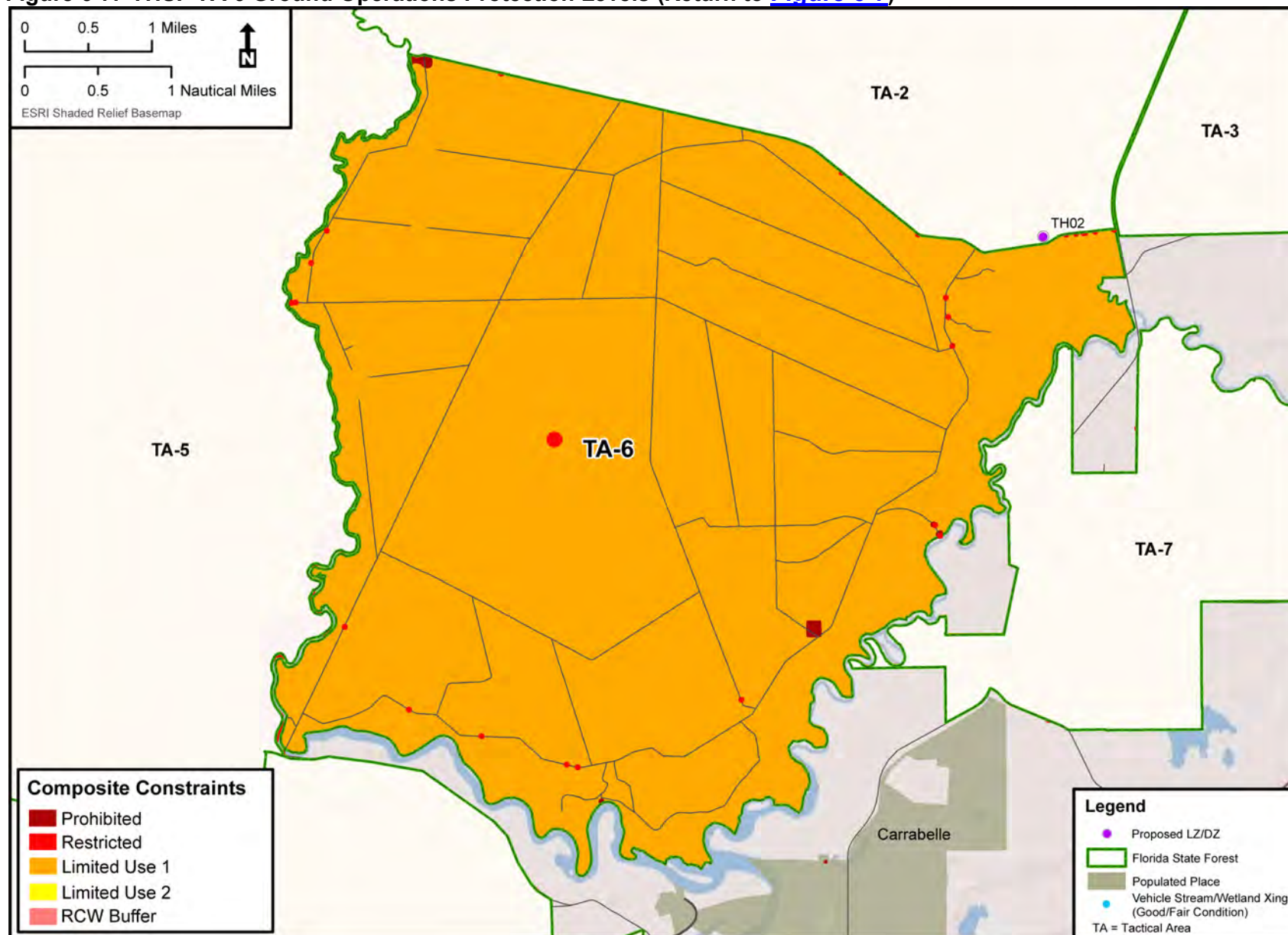




Figure 6-8. THSF TA-7 Ground Operations Protection Levels (Return to [Figure 6-8](#))

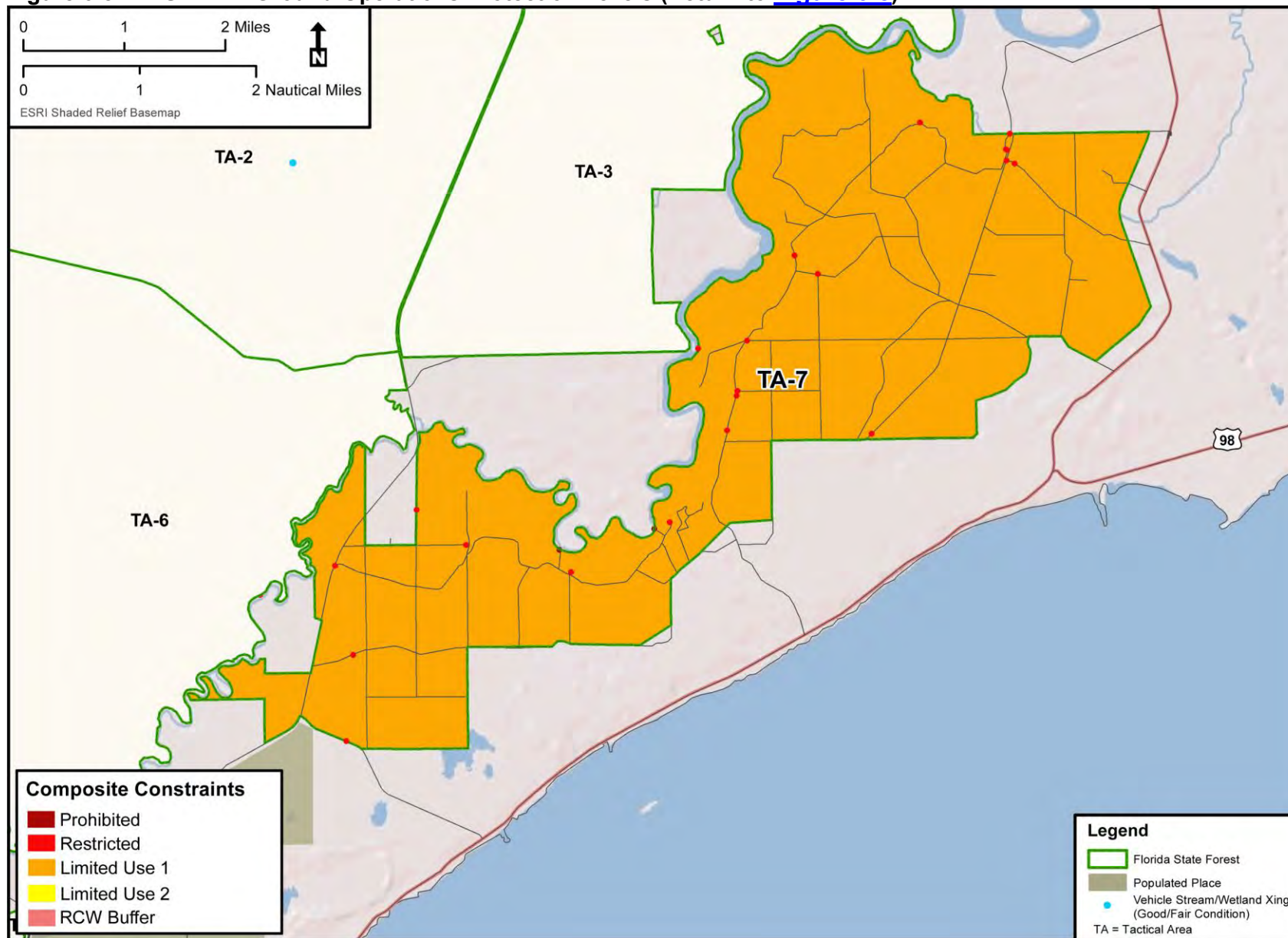
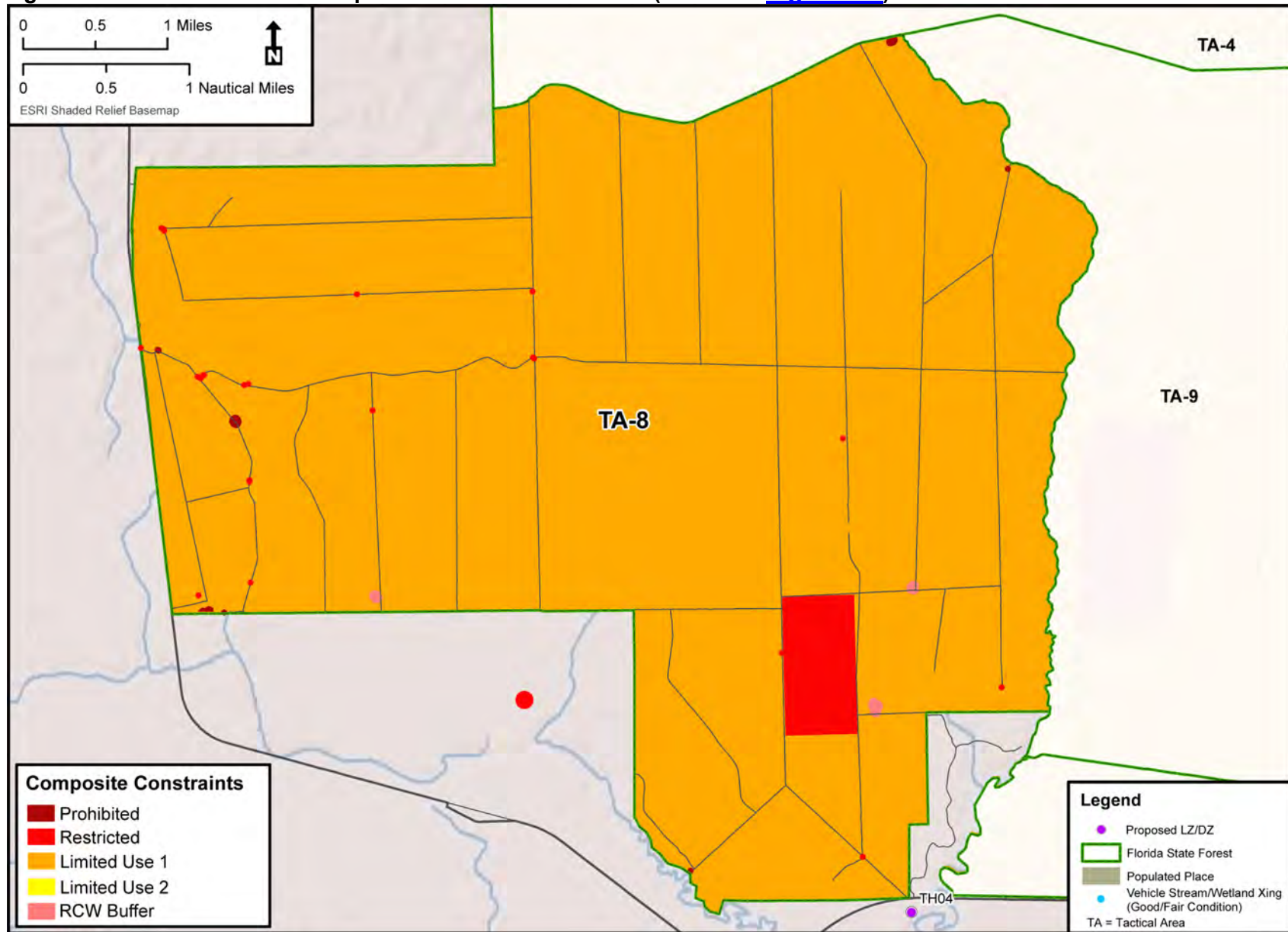


Figure 6-9. THSF TA-8 Ground Operations Protection Levels (Return to [Figure 6-9](#))



**Figure 6-10. THSF TA-9 Ground Operations Protection Levels (Return to [Figure 6-10](#))**

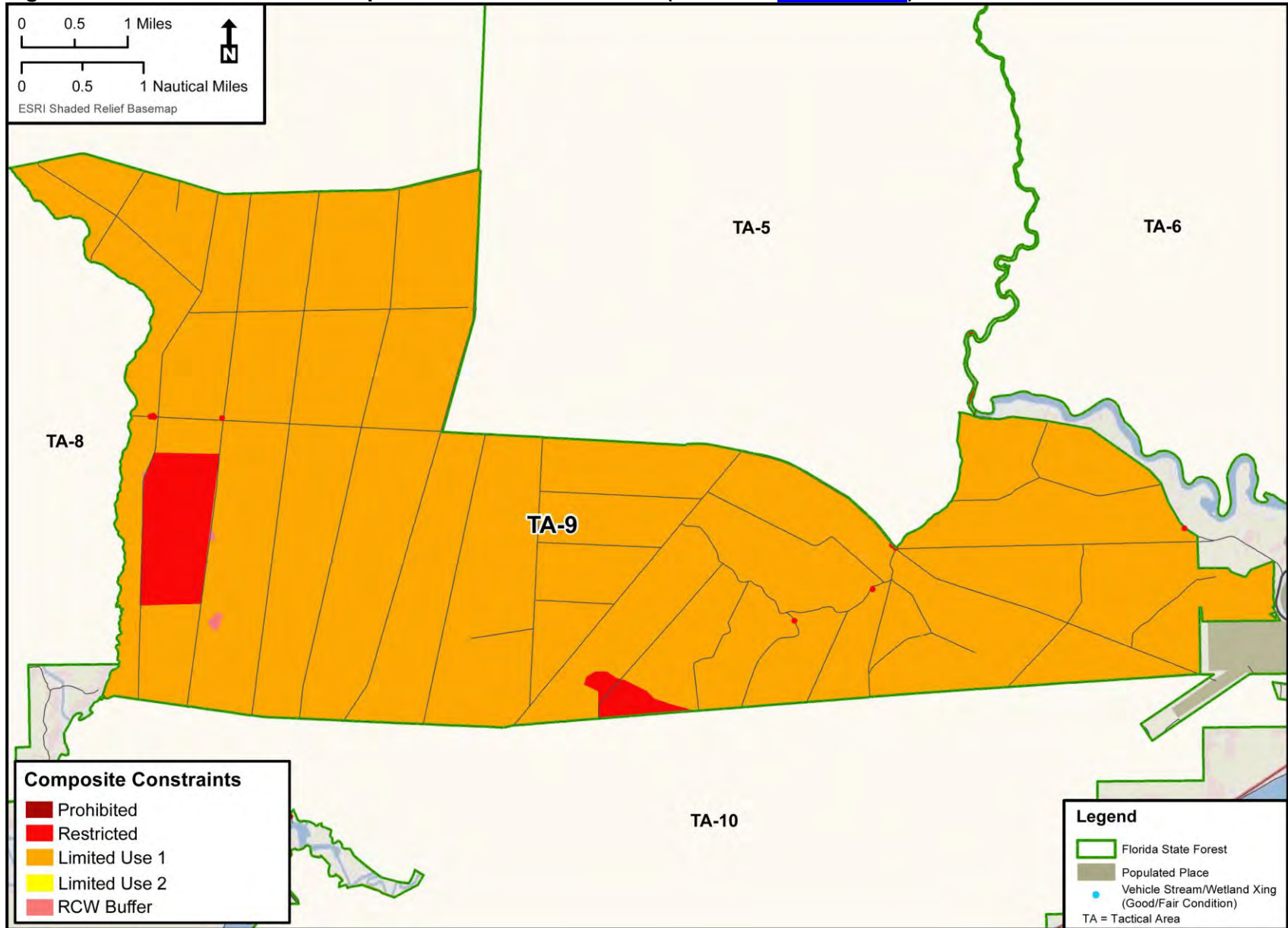




Figure 6-11. THSF TA-10 Ground Operations Protection Levels (Return to [Figure 6-11](#))

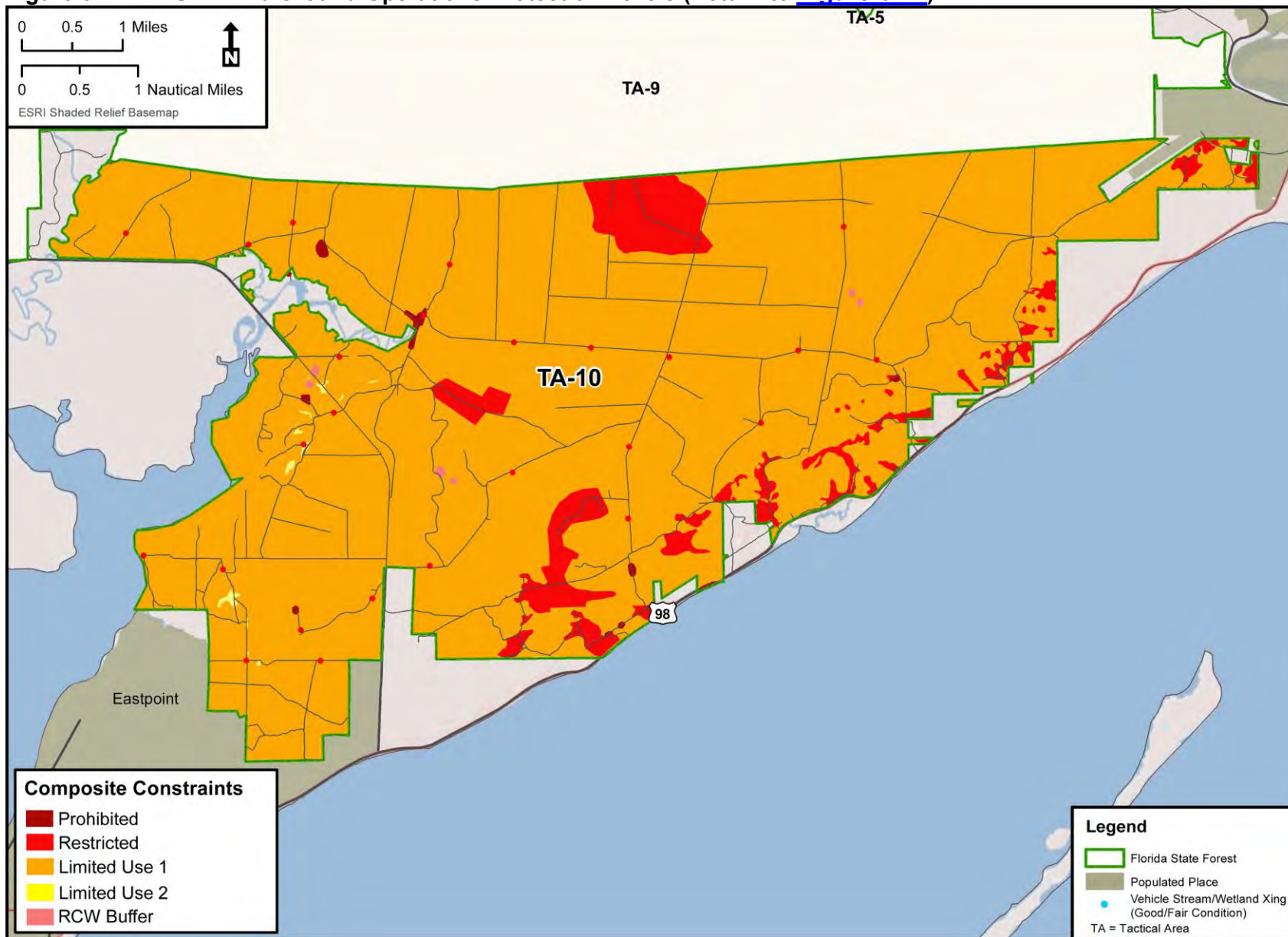




Figure 6-12. THSF Noise Protection Levels Overview (Return to [Figure 6-12](#))

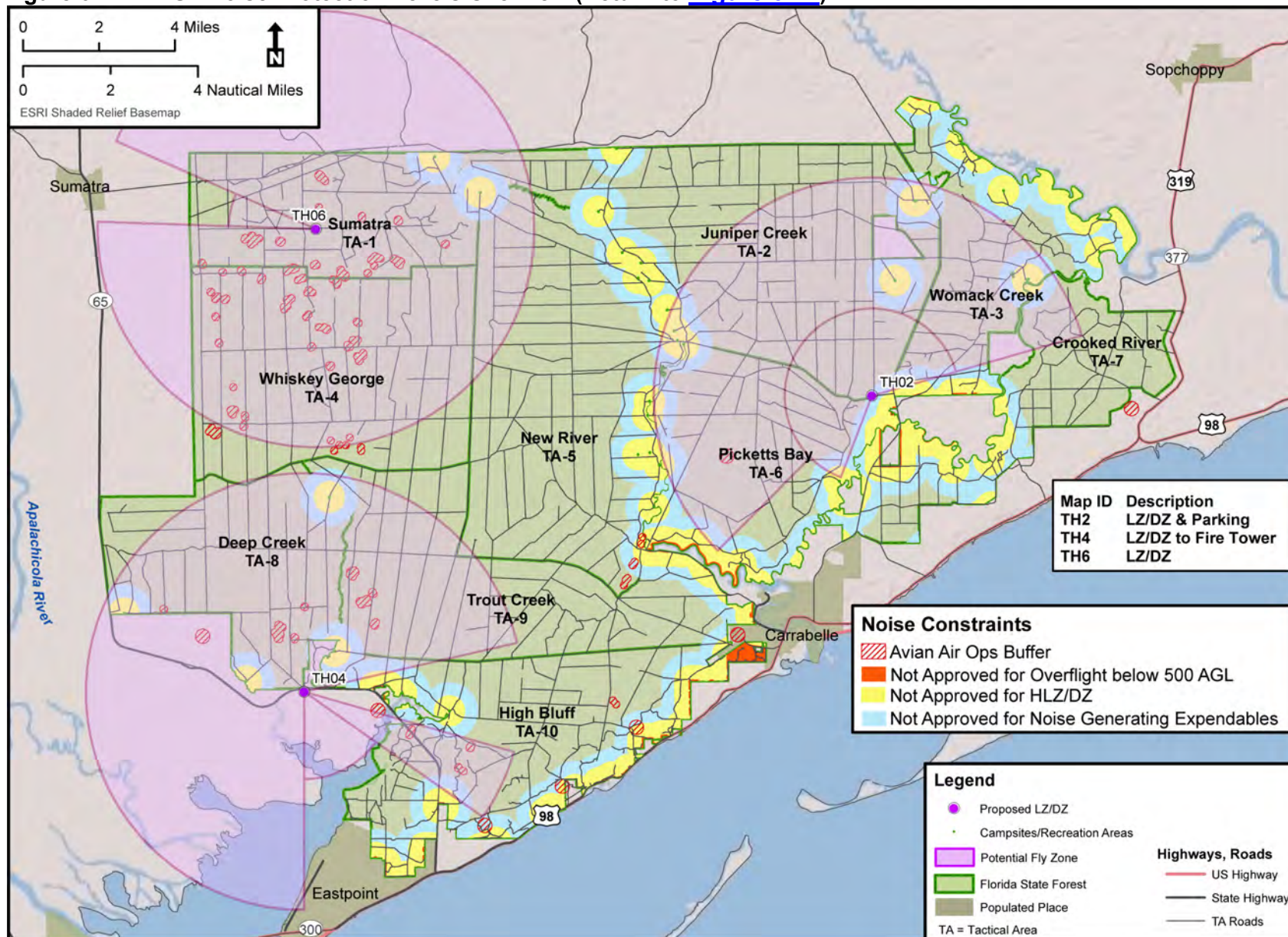


Figure 6-13. THSF TA-1 Noise Protection Levels (Return to [Figure 6-13](#))

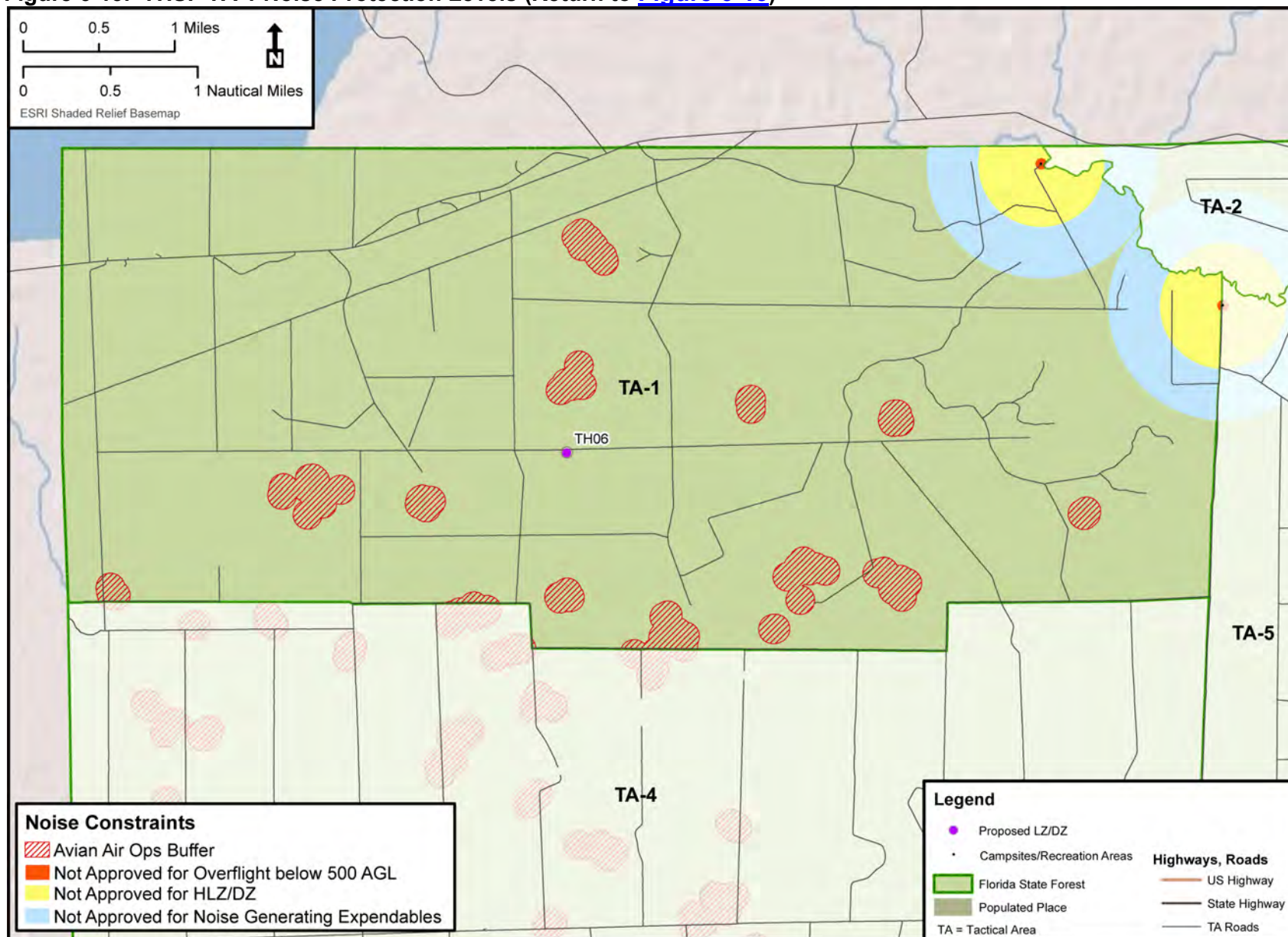




Figure 6-14. THSF TA-2 Noise Protection Levels (Return to [Figure 6-14](#))

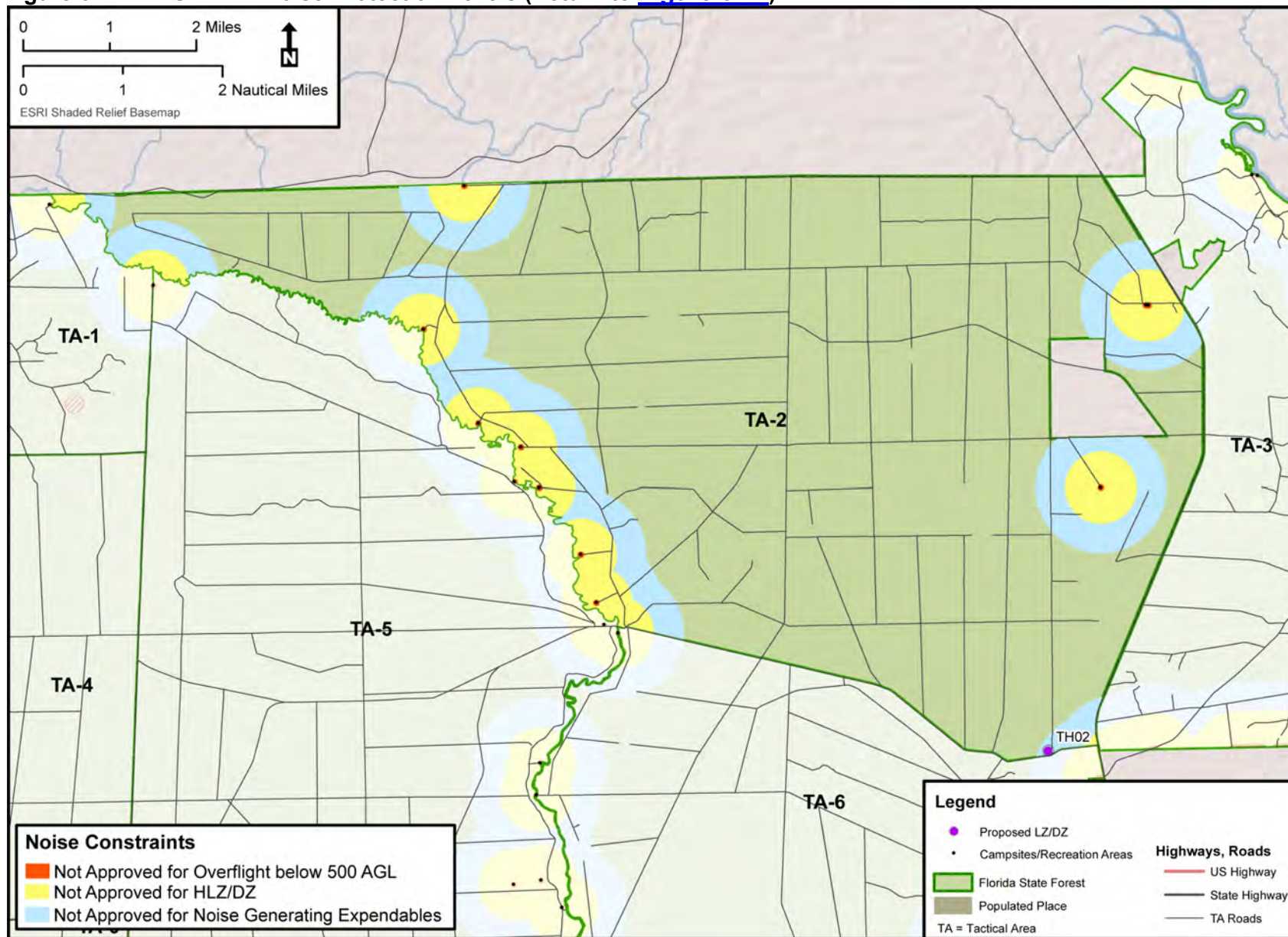


Figure 6-15. THSF TA-3 Noise Protection Levels (Return to [Figure 6-15](#))

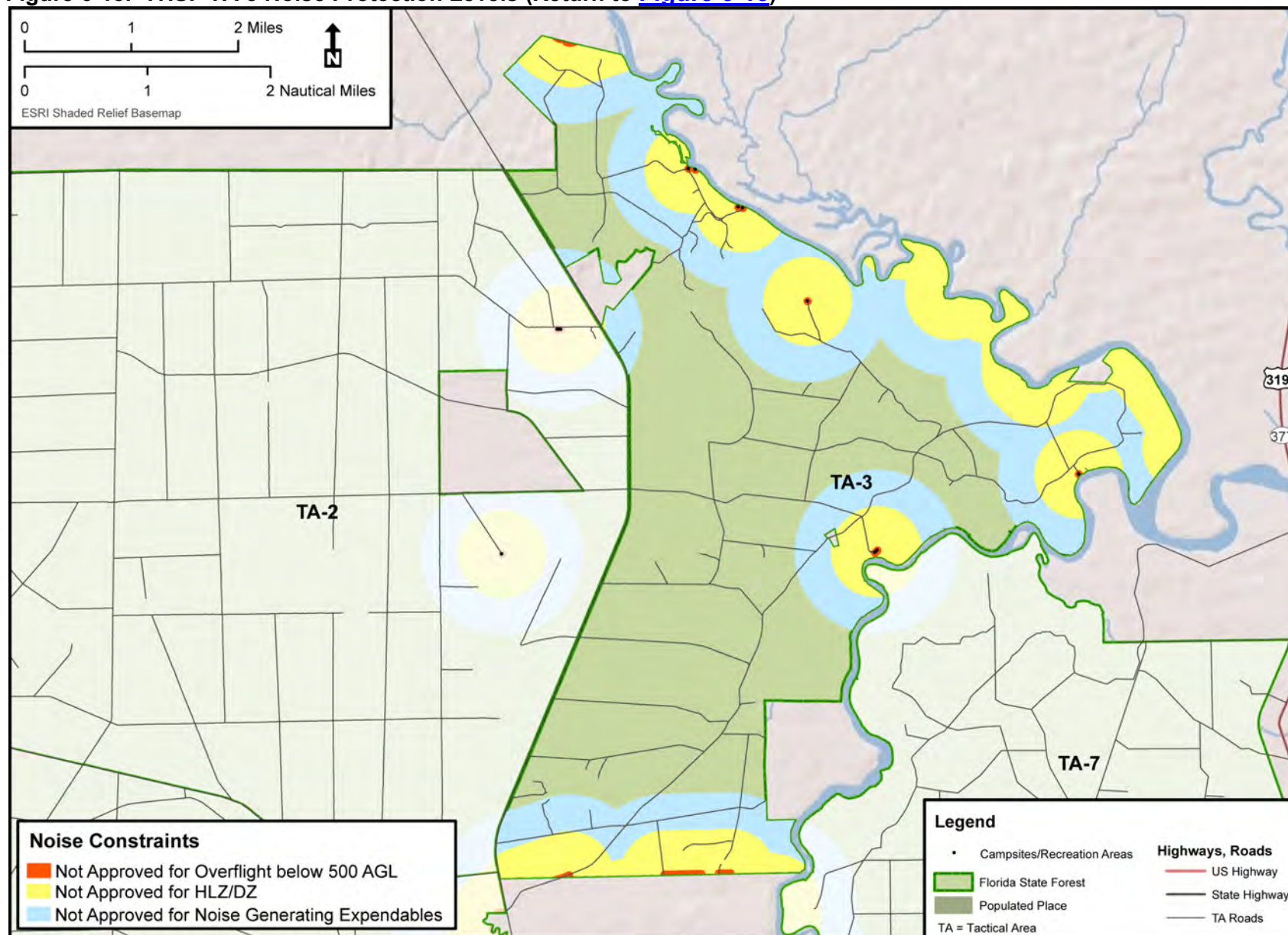




Figure 6-16. THSF TA-4 Noise Protection Levels (Return to [Figure 6-16](#))

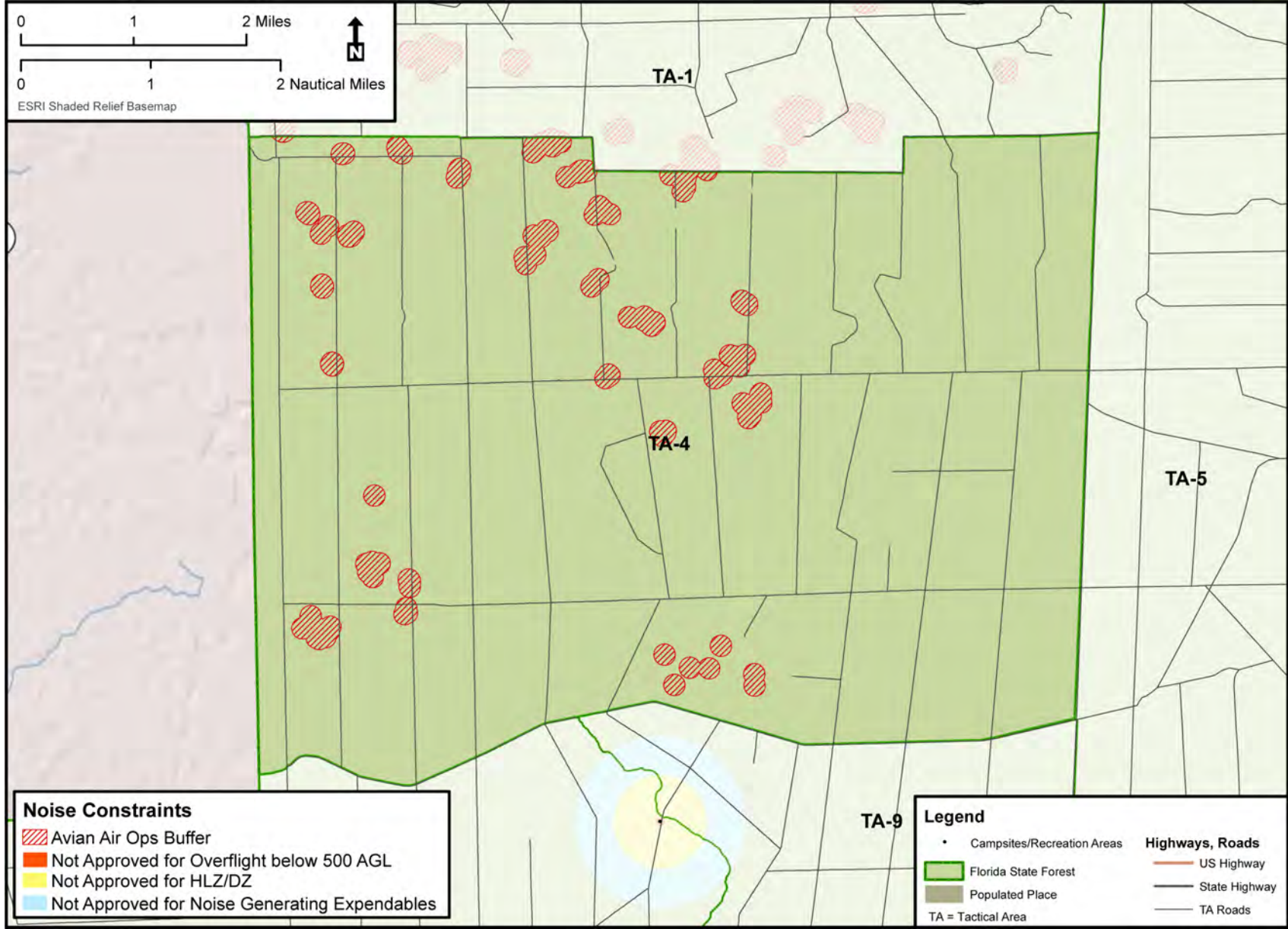


Figure 6-17. THSF TA-5 Noise Protection Levels (Return to [Figure 6-17](#))

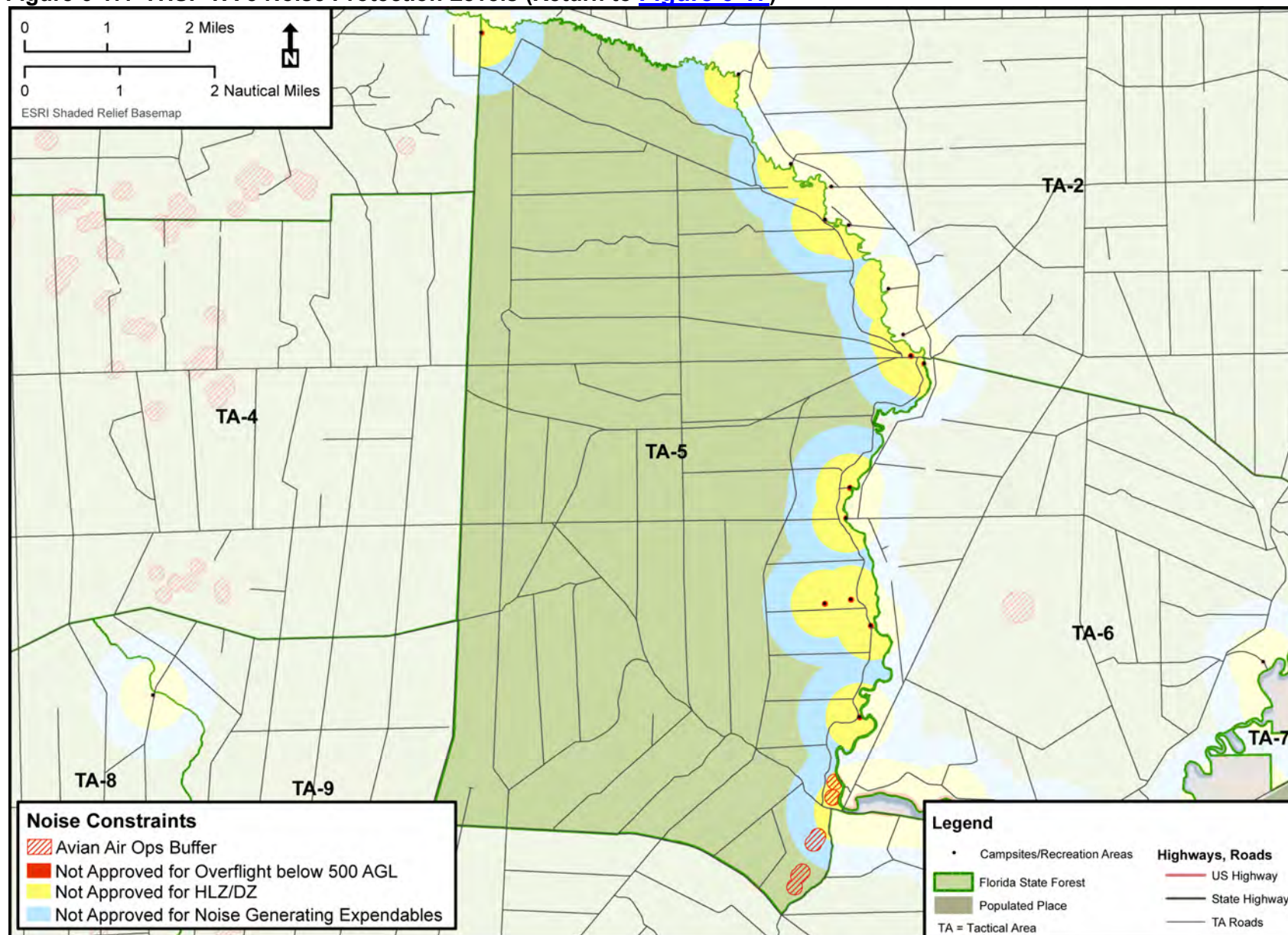




Figure 6-18. THSF TA-6 Noise Protection Levels (Return to [Figure 6-18](#))

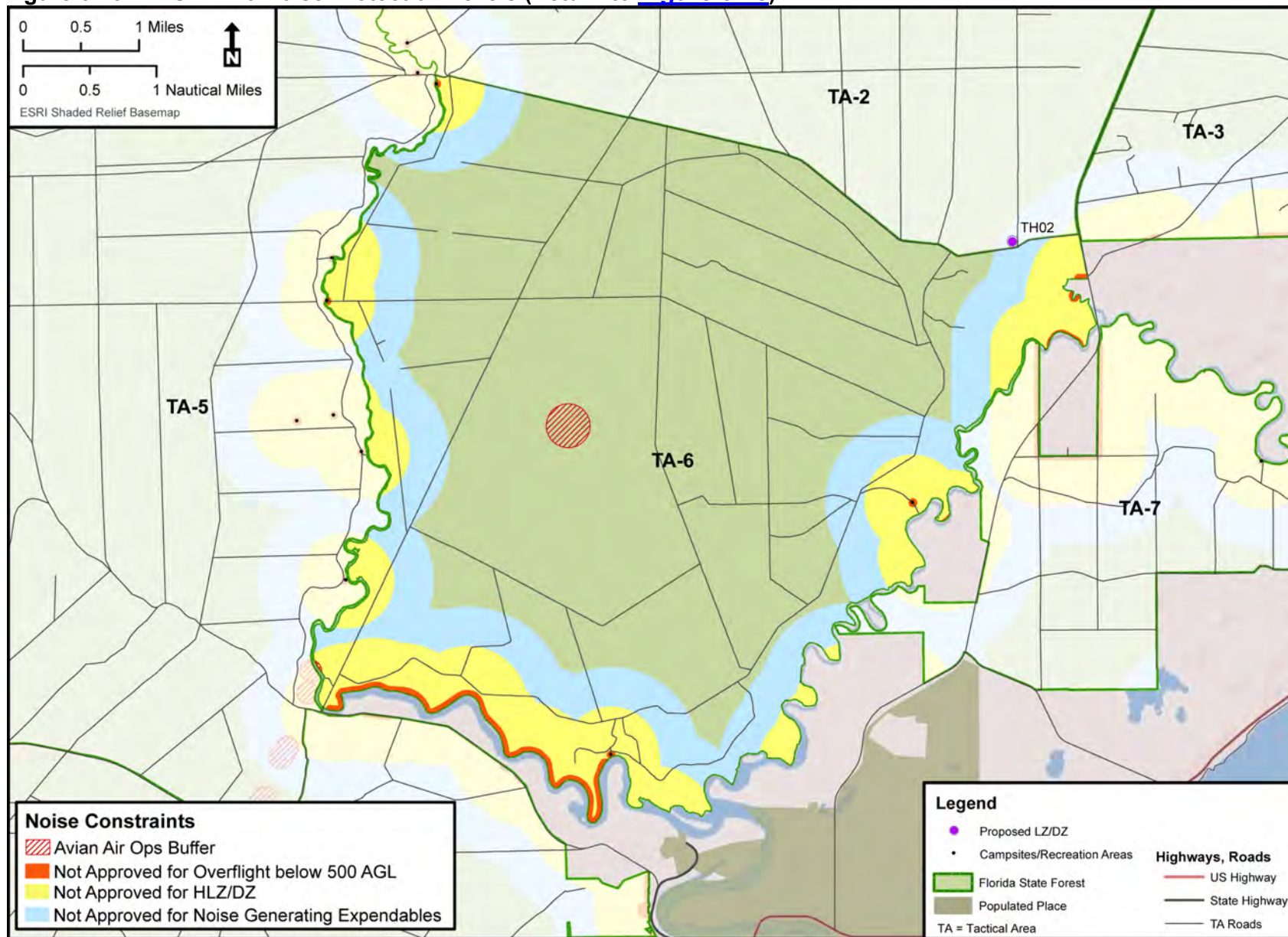


Figure 6-19. THSF TA-7 Noise Protection Levels (Return to [Figure 6-19](#))

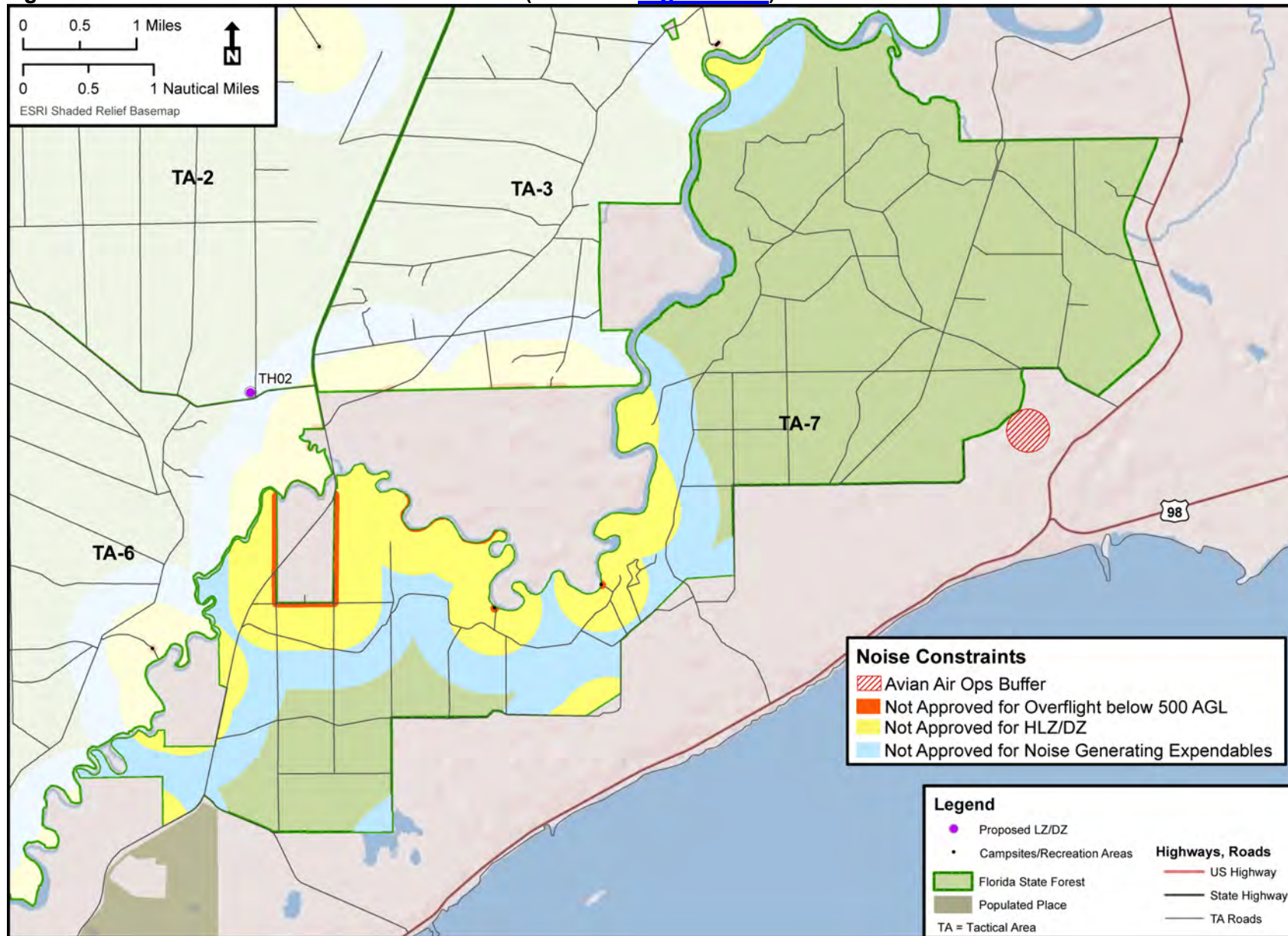




Figure 6-20. THSF TA-8 Noise Protection Levels (Return to [Figure 6-20](#))

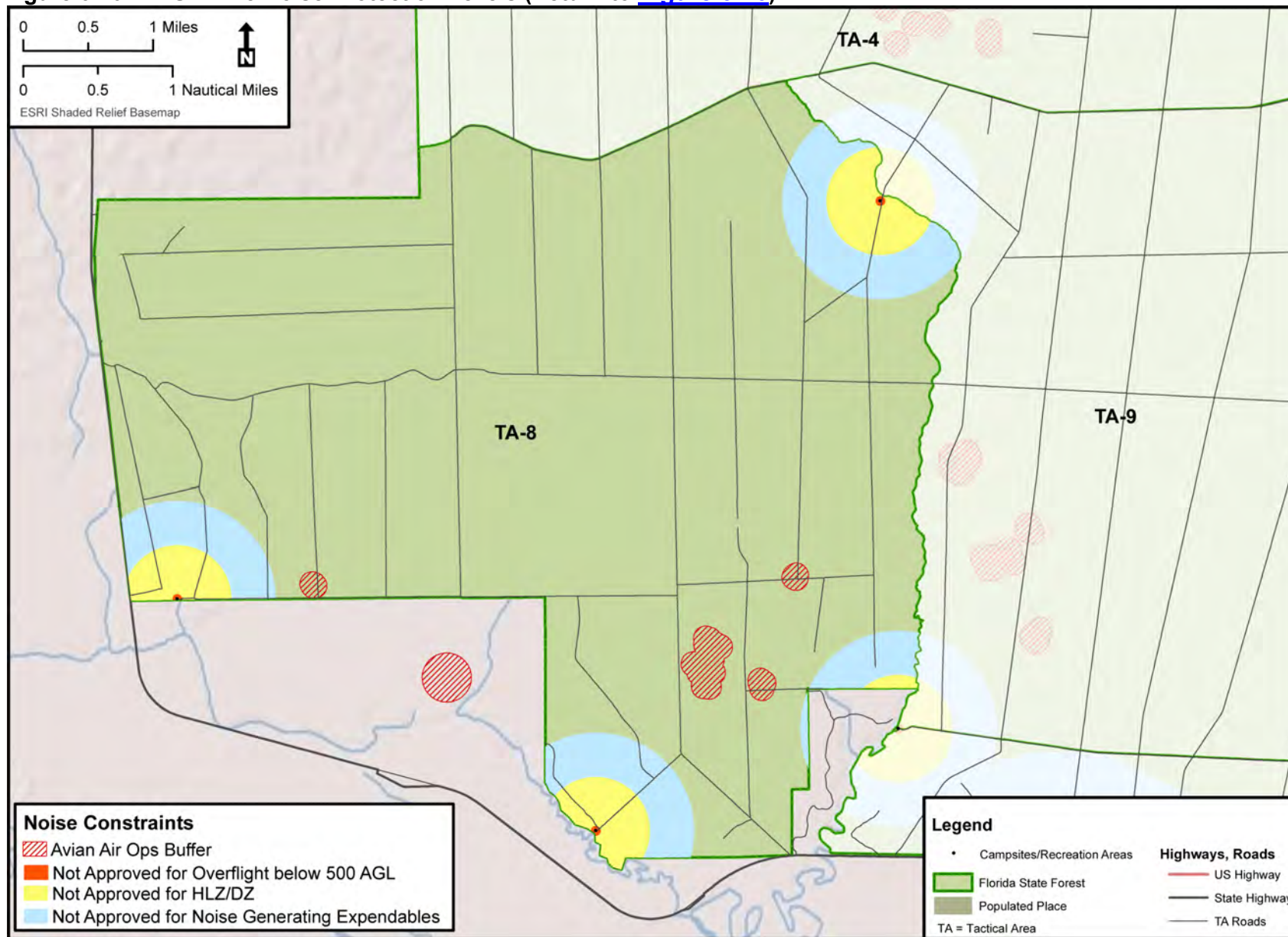


Figure 6-21. THSF TA-9 Noise Protection Levels (Return to [Figure 6-21](#))

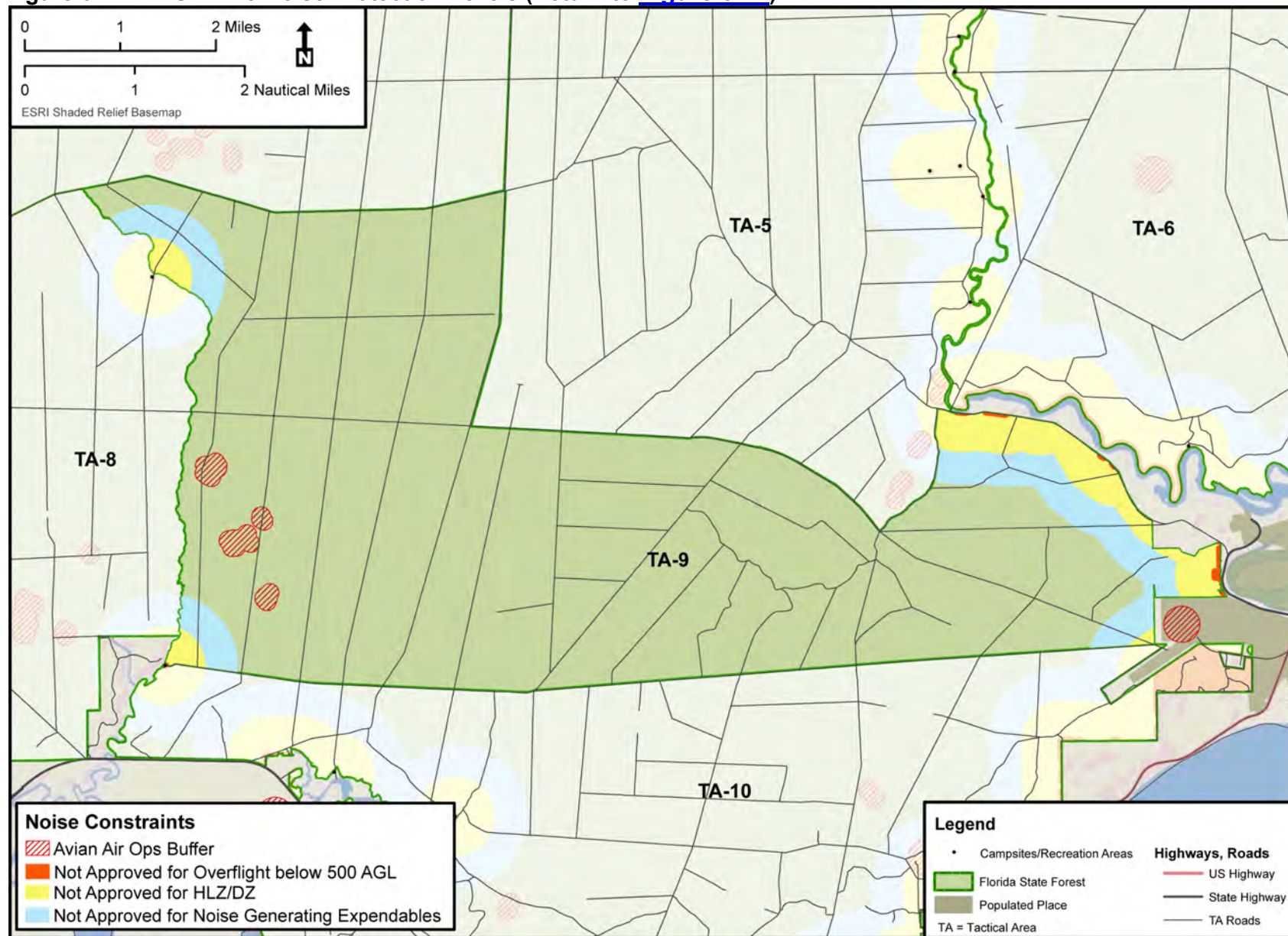




Figure 6-22. THSF TA-10 Noise Protection Levels (Return to [Figure 6-22](#))

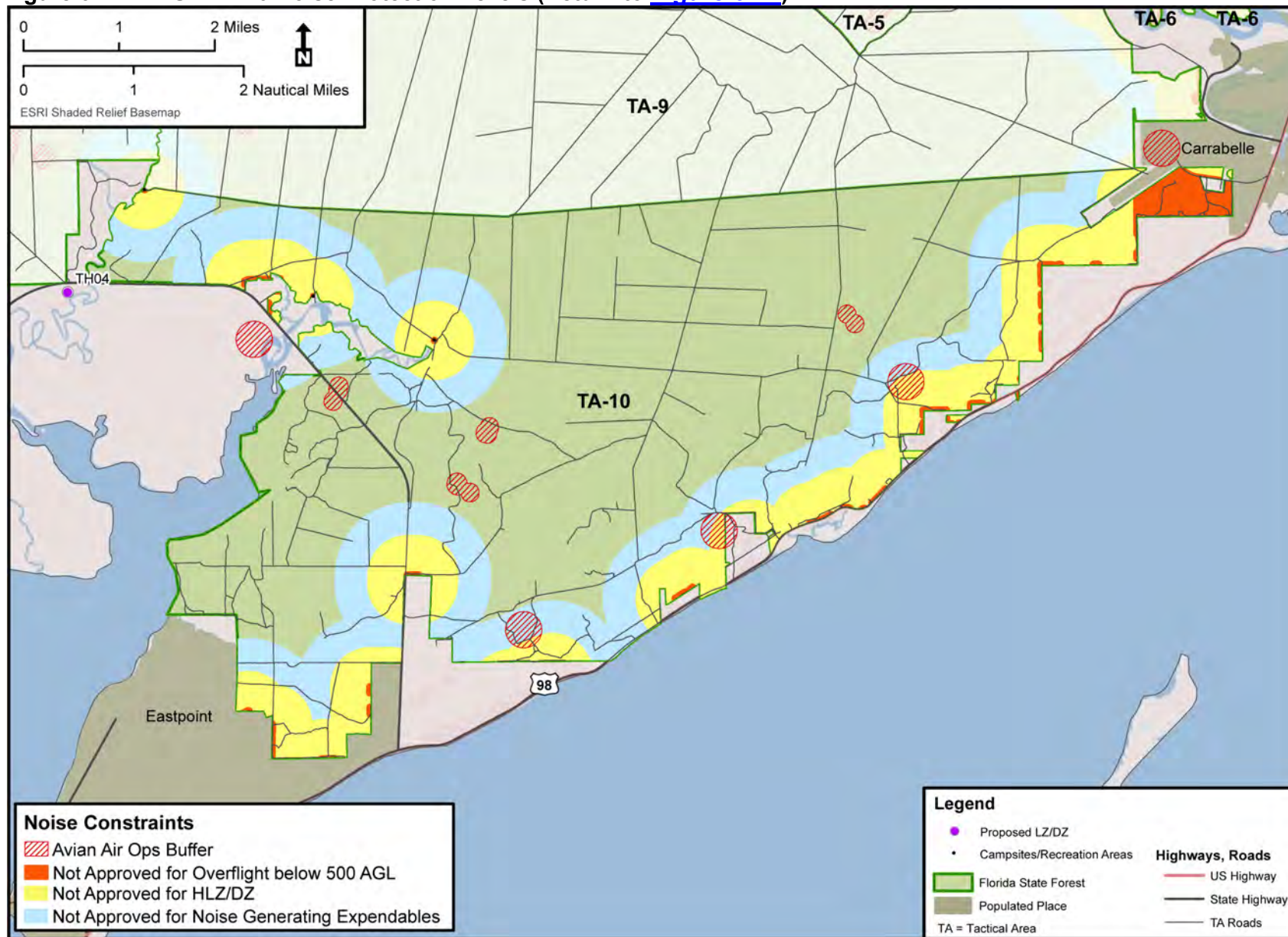
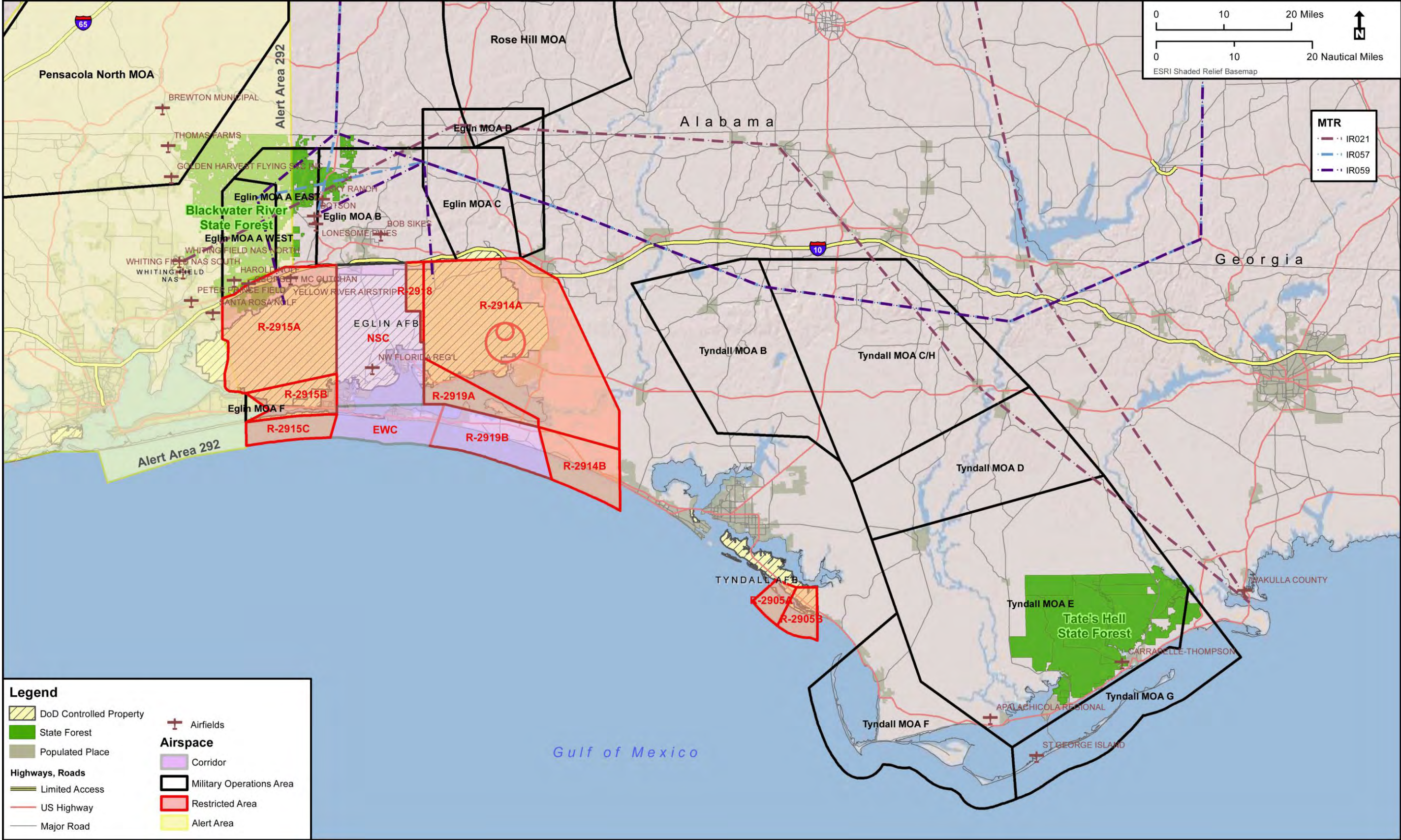




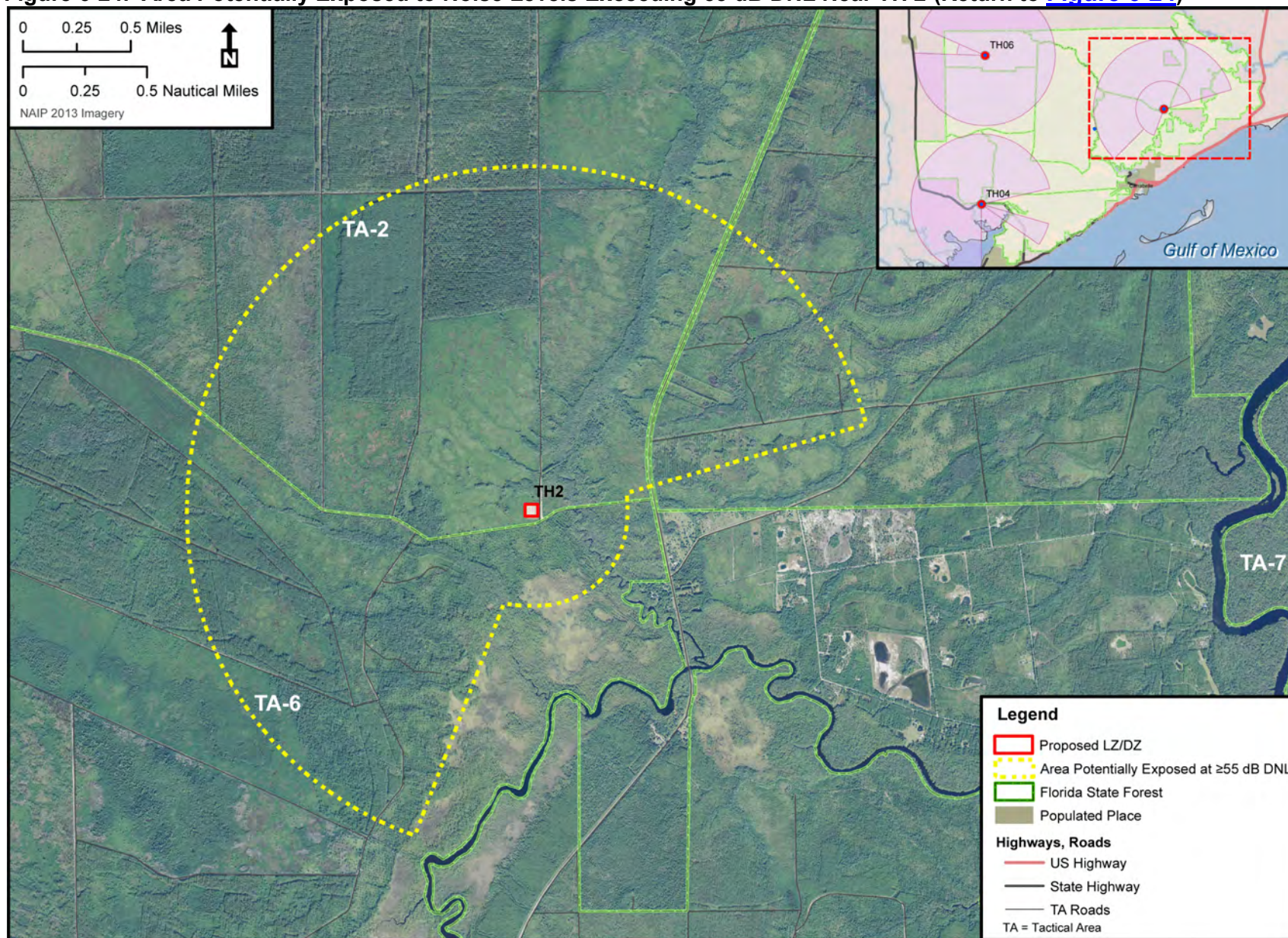
Figure 6-23. Special Use Airspace Units and Airfields (Return to [Figure 6-23](#))





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Figure 6-24. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 2 (Return to [Figure 6-24](#))





**Figure 6-25. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 4 (Return to [Figure 6-25](#))**

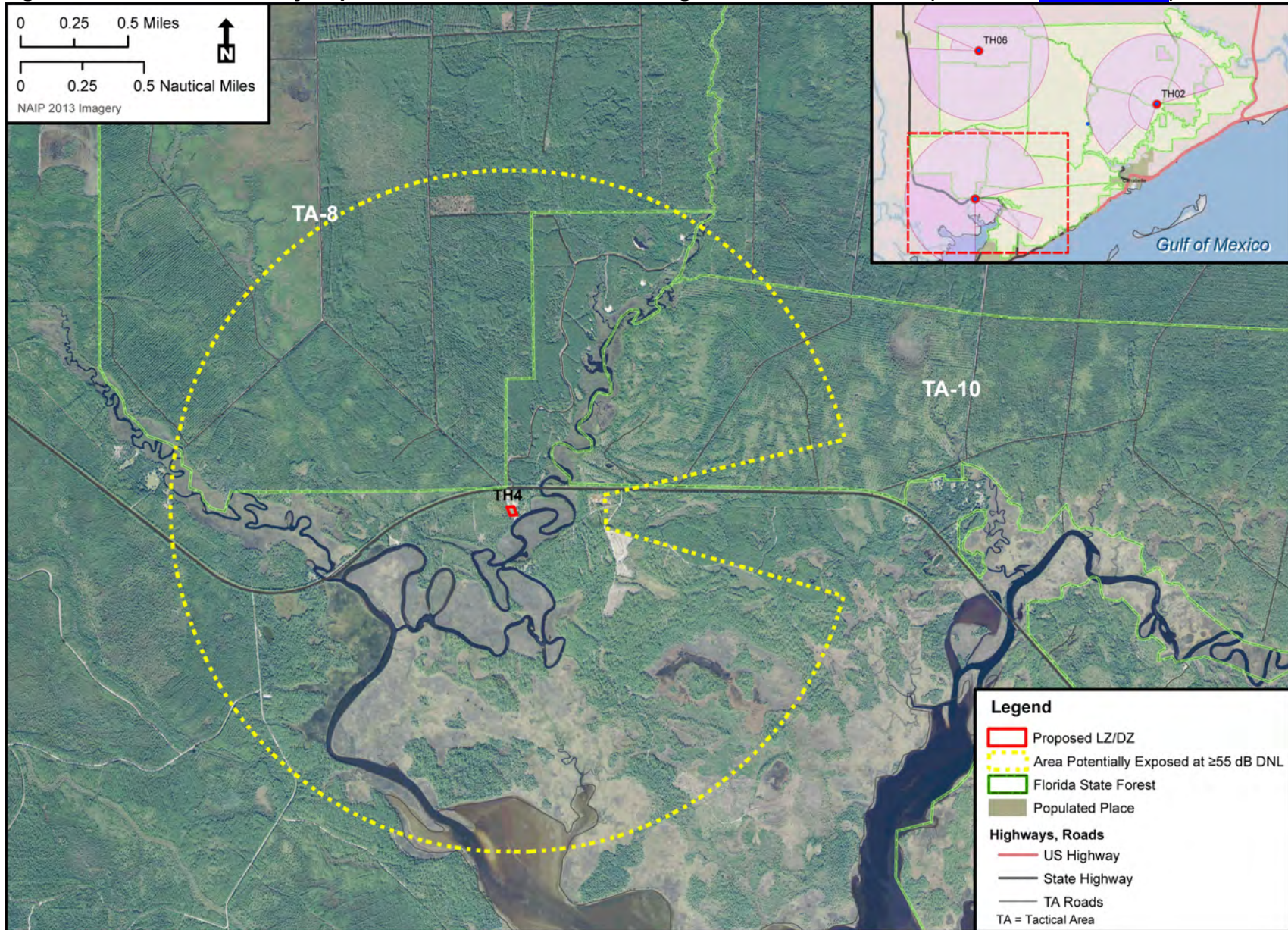




Figure 6-26. Area Potentially Exposed to Noise Levels Exceeding 55 dB DNL Near TH 6 (Return to [Figure 6-26](#))

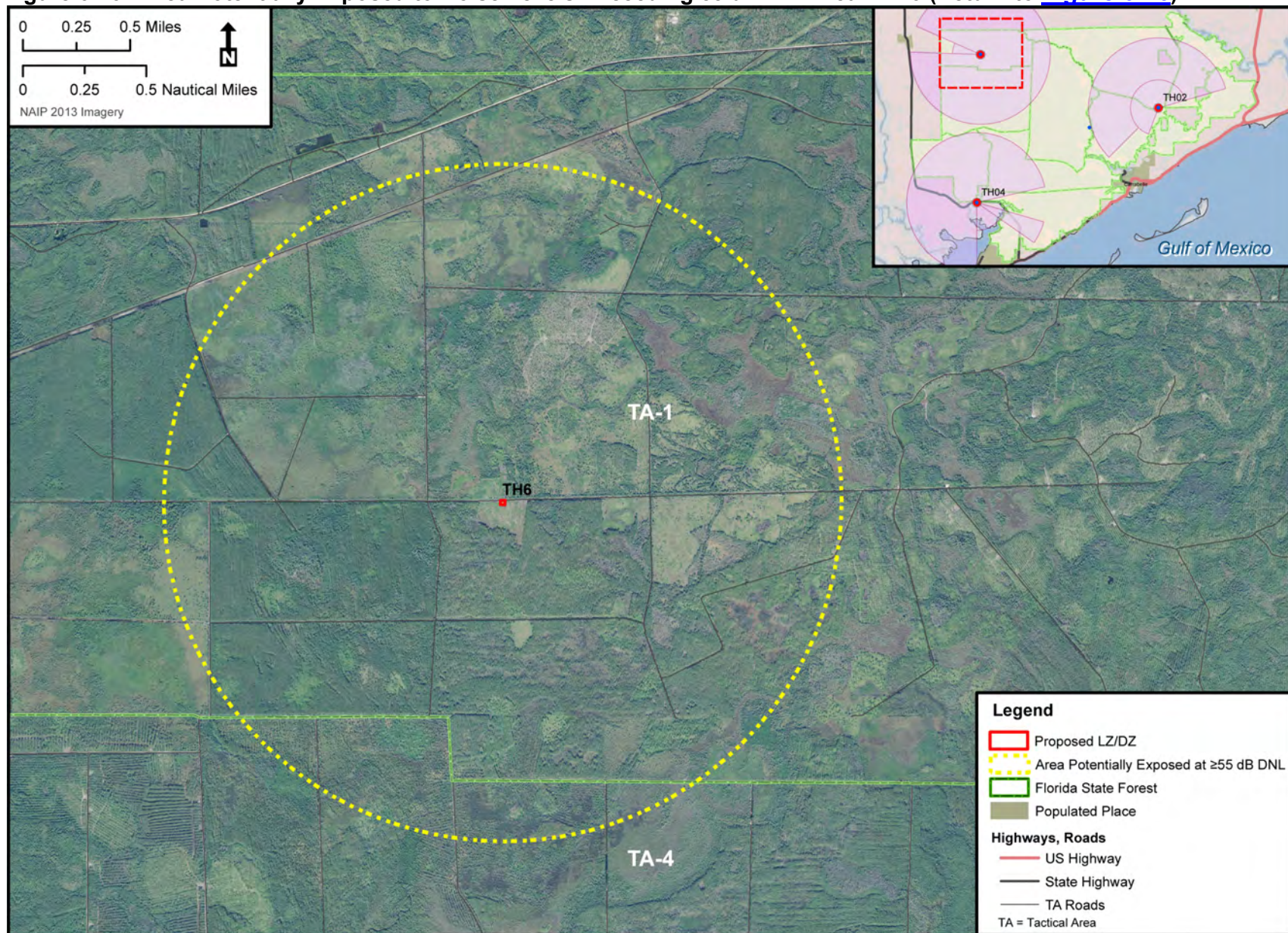




Figure 6-27. THSF Sensitive Karst Areas, Closed Depressions, and Gulf Coastline (Return to [Figure 6-27](#))

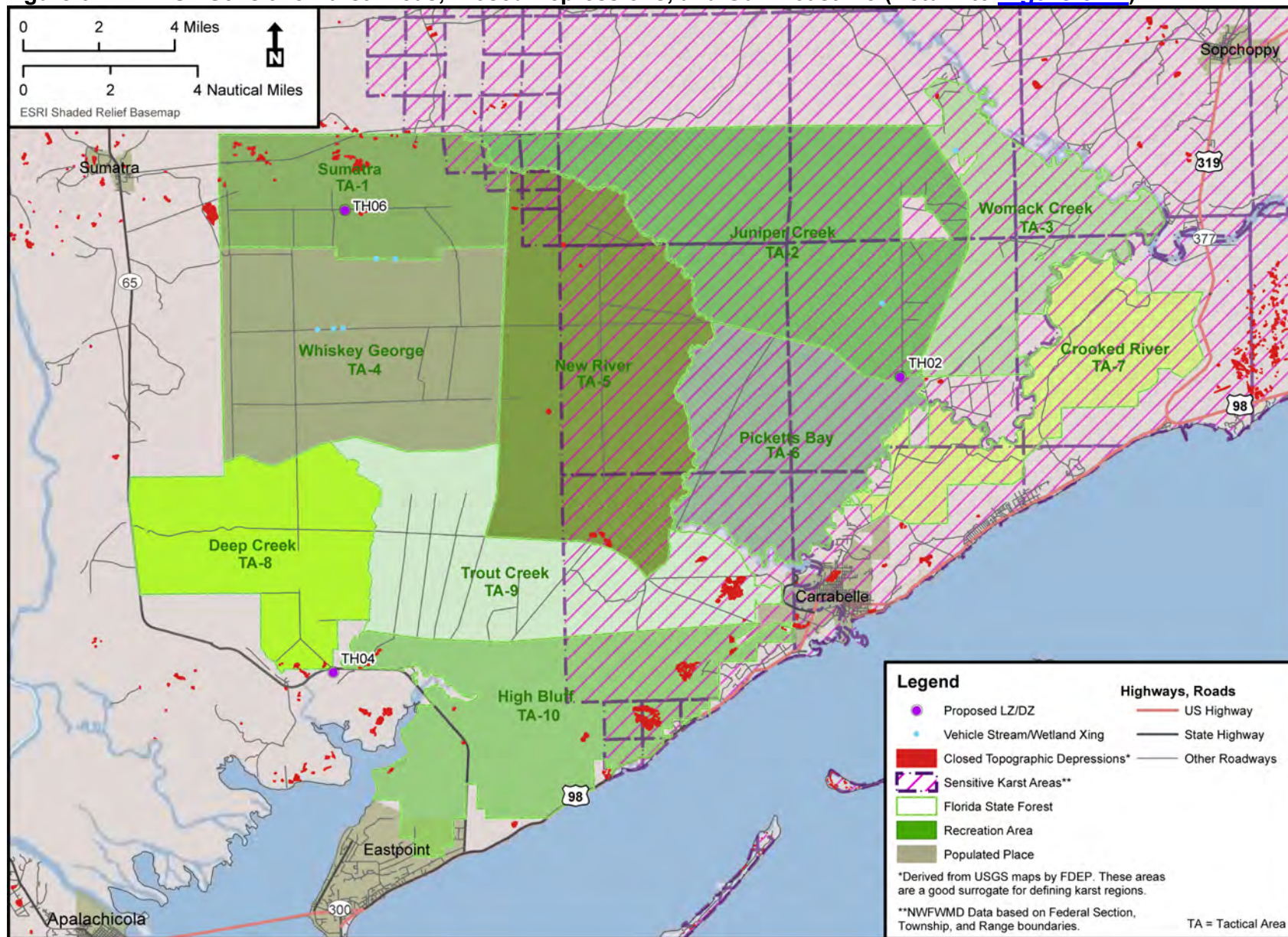




Figure 6-28. Closed Depressions, Steepheads, and Borrow Pits – TH2 (Return to [Figure 6-28](#))

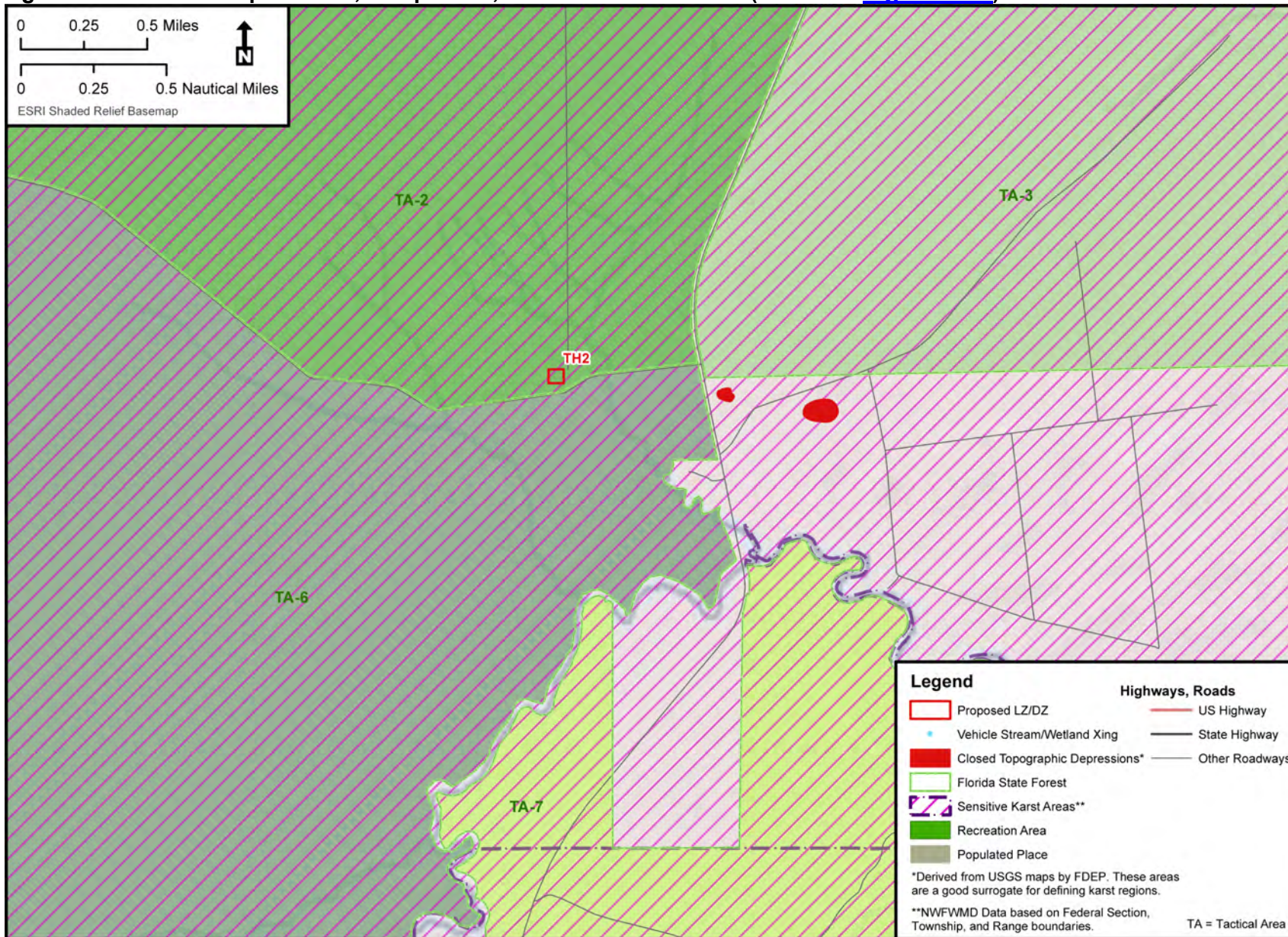




Figure 6-29. Closed Depressions, Steepheads, and Borrow Pits – TH4 (Return to [Figure 6-29](#))

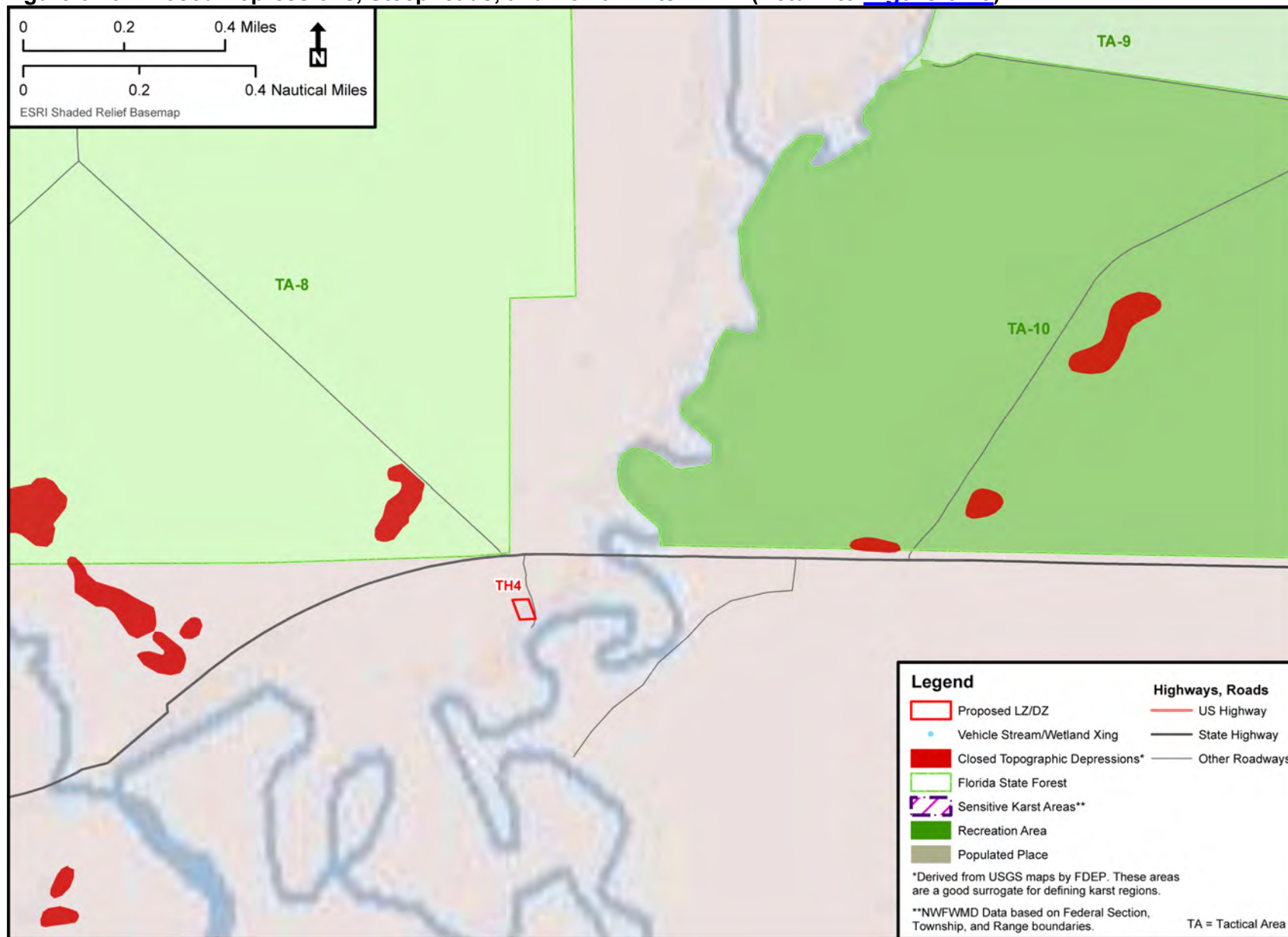


Figure 6-30. Closed Depressions, Steepheads, and Borrow Pits – TH6 (Return to [Figure 6-30](#))

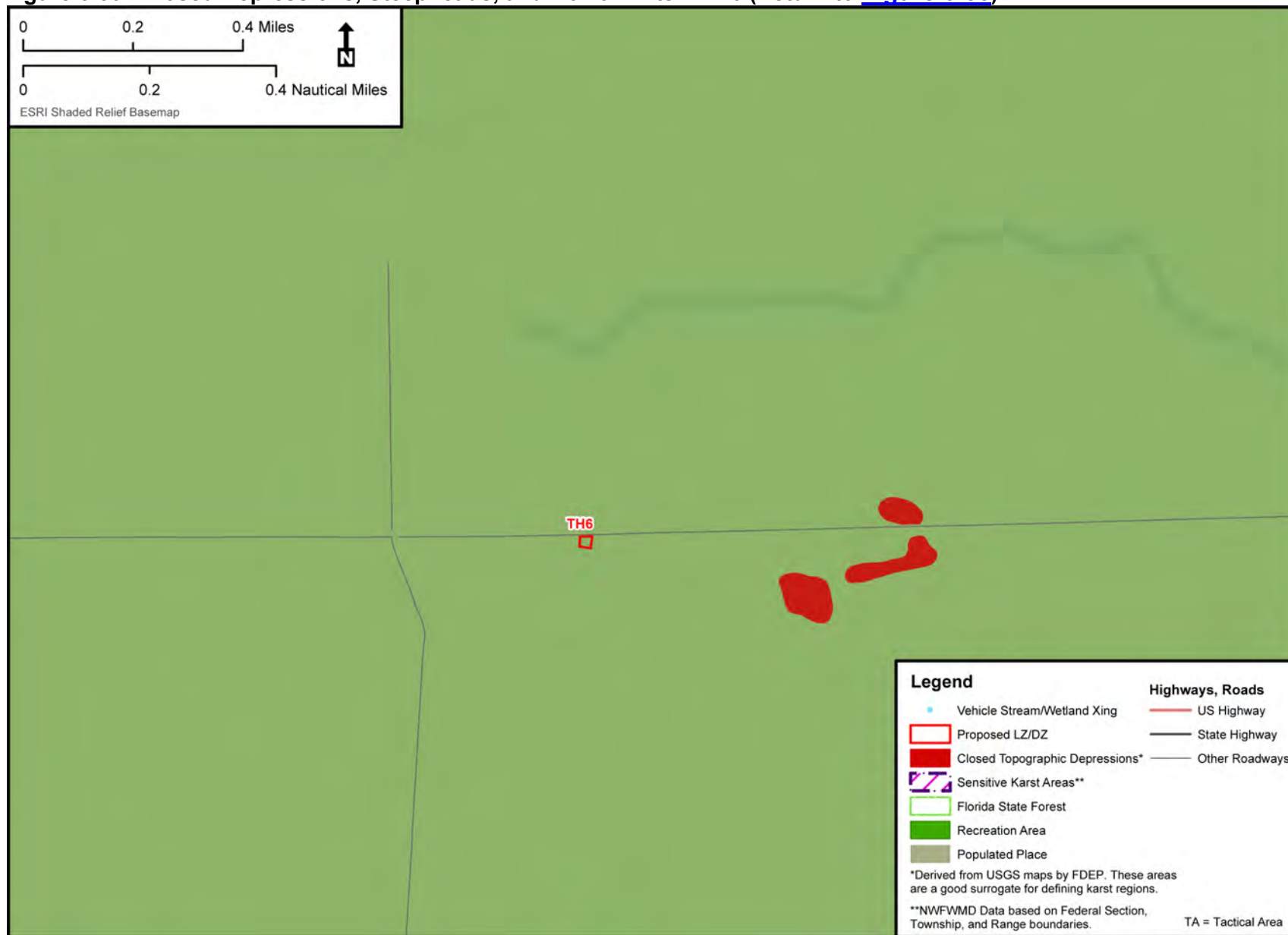




Figure 6-31. THSF Soil Suborders (Return to [Figure 6-31](#))

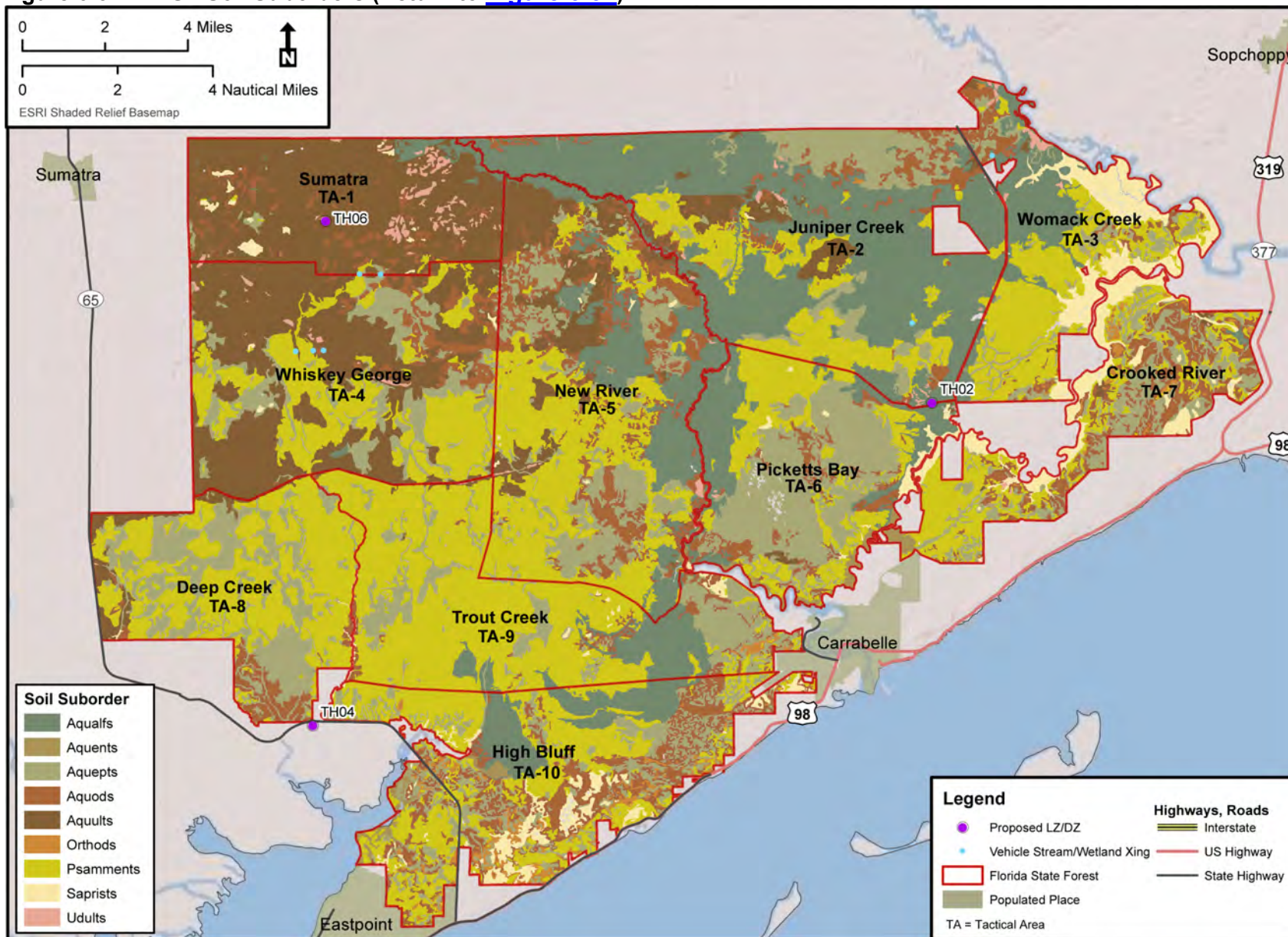


Figure 6-32. THSF Hydric Soils (Return to [Figure 6-32](#))

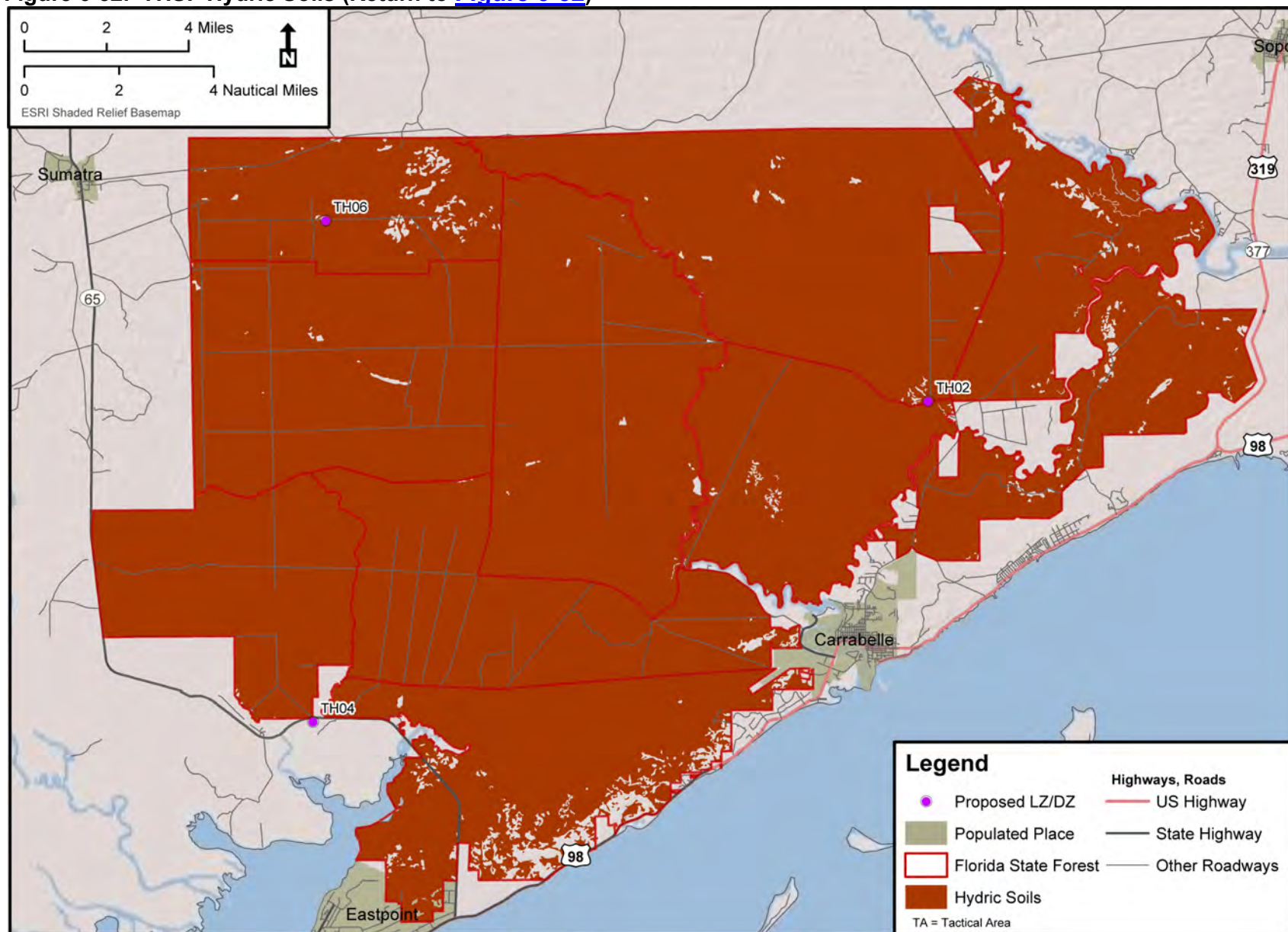




Figure 6-33. Prime Farmland – TH2 (Return to [Figure 6-33](#))

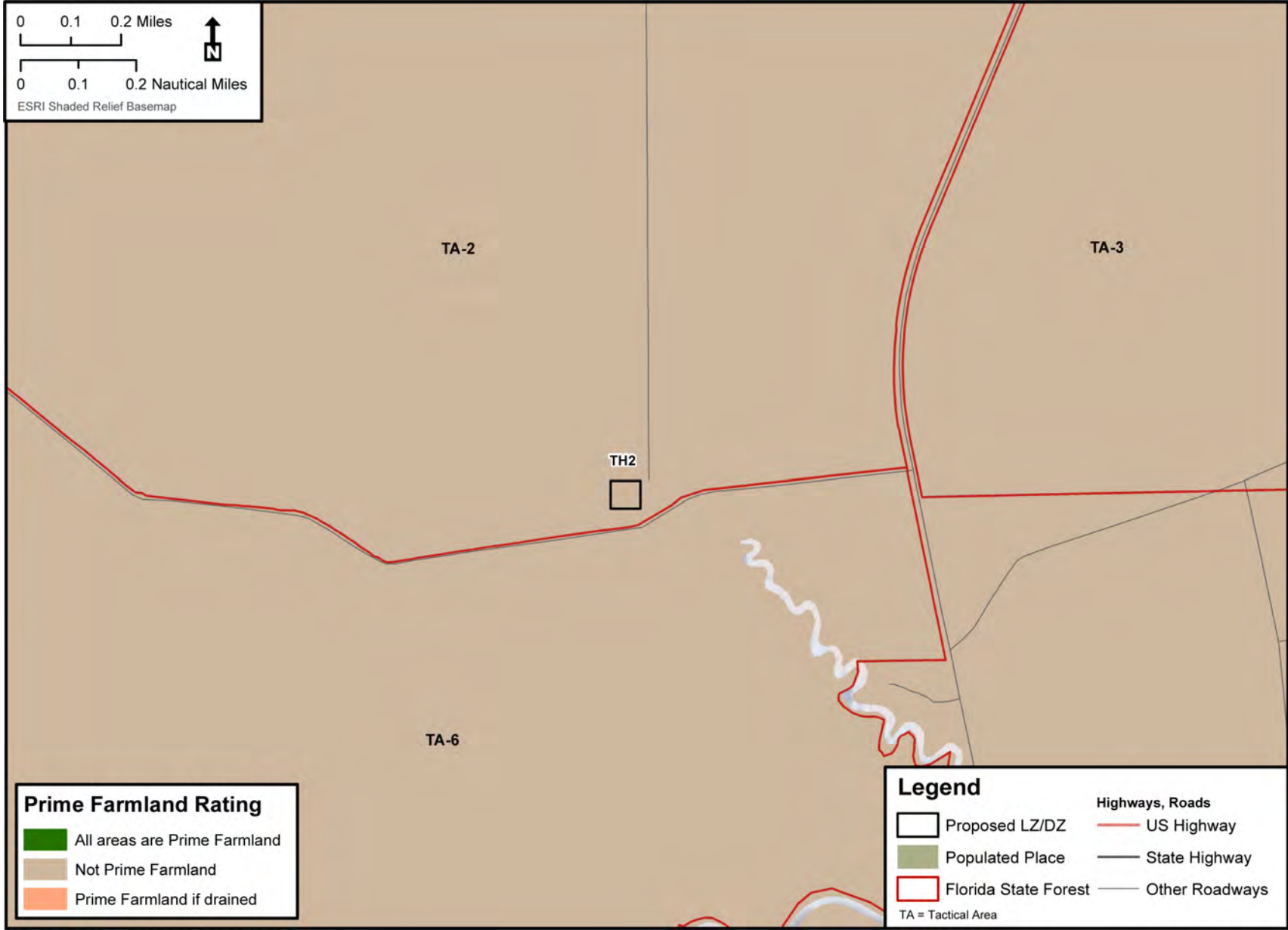
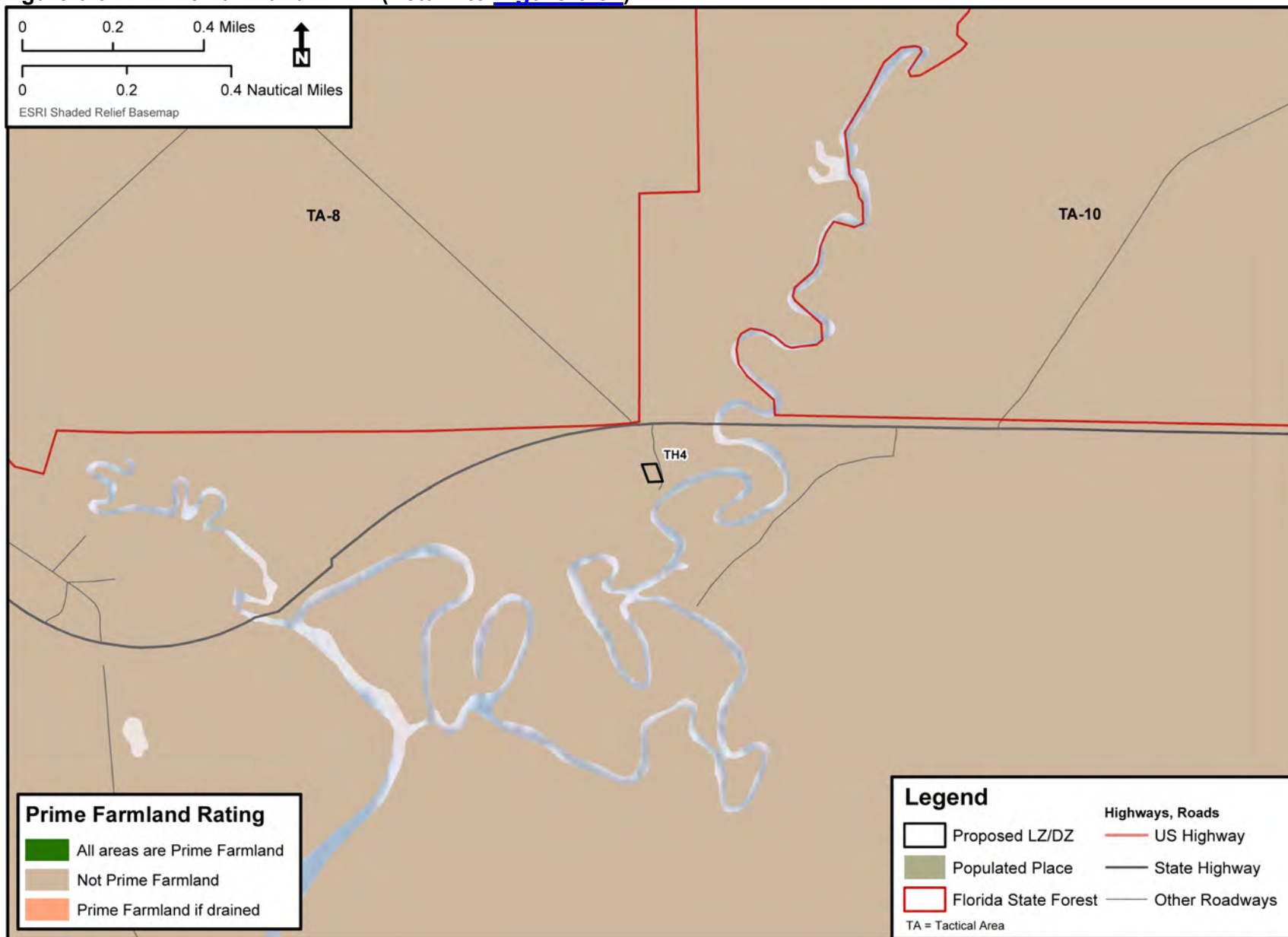


Figure 6-34. Prime Farmland – TH4 (Return to [Figure 6-34](#))





**Figure 6-35. Prime Farmland – TH6 (Return to [Figure 6-35](#))**

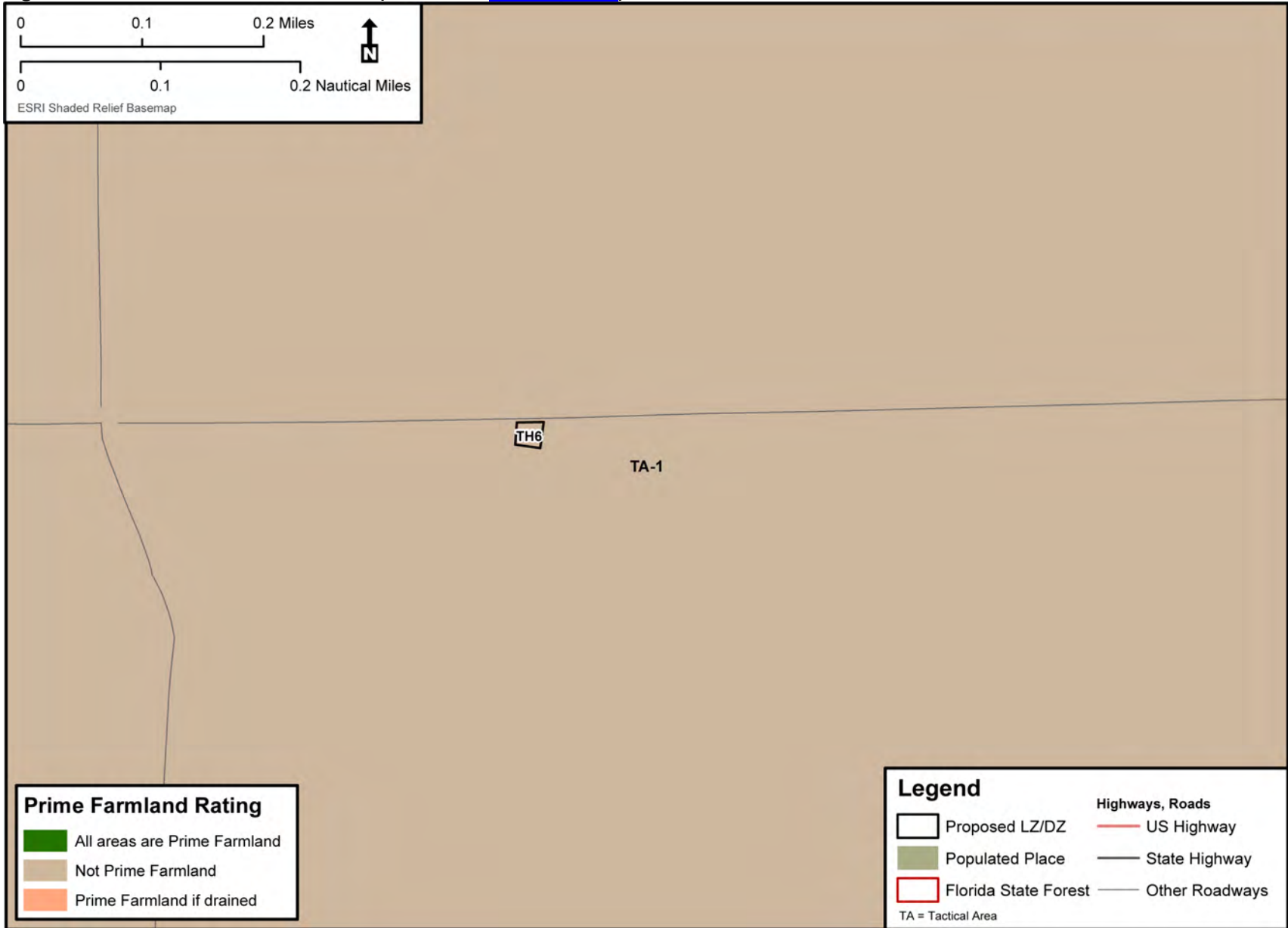


Figure 6-36. THSF Unpaved Roads and Crossings (Return to [Figure 6-36](#))

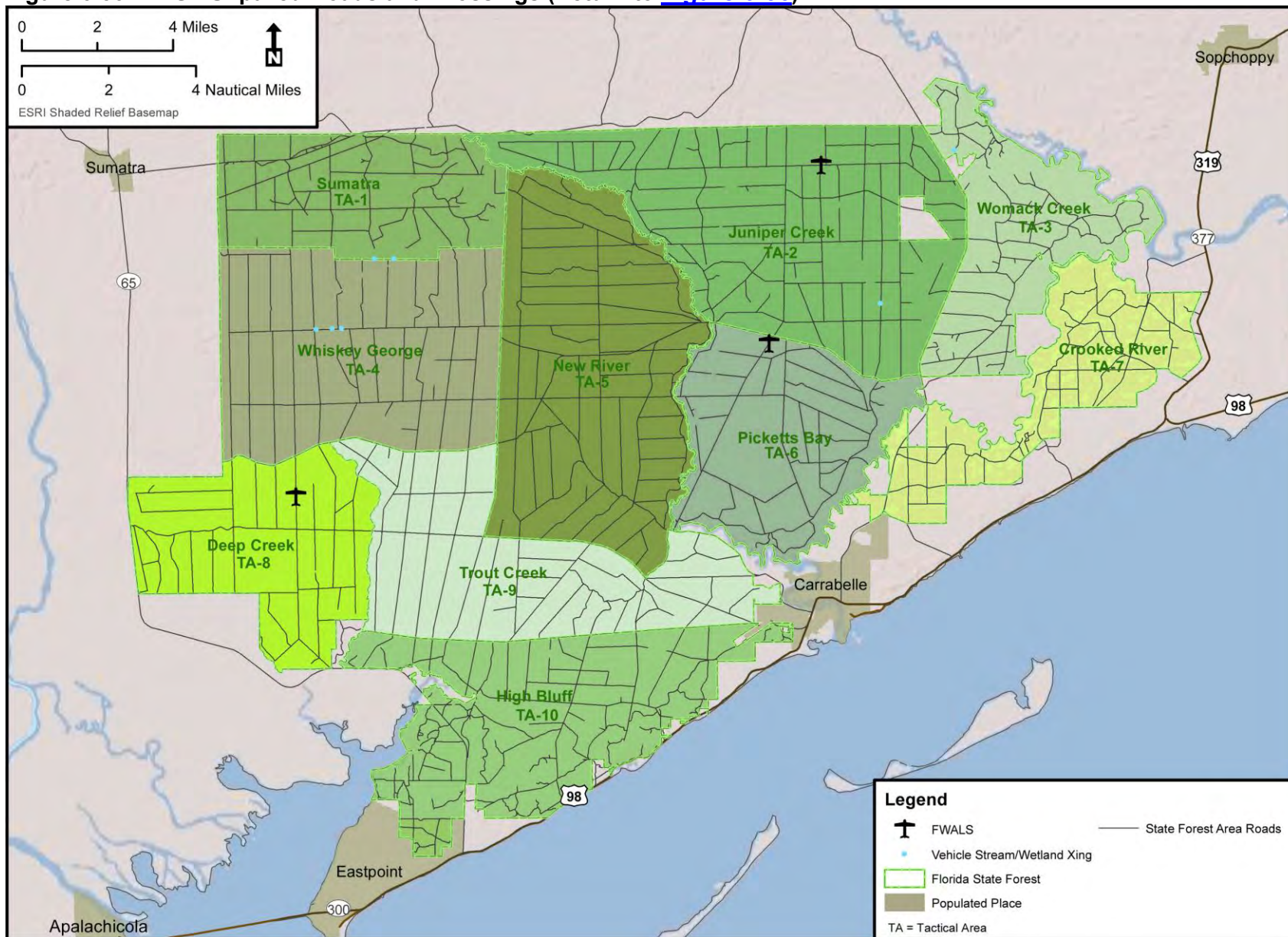




Figure 6-28. THSF Bivouac Constraint Areas (Return to [Figure 6-37](#))

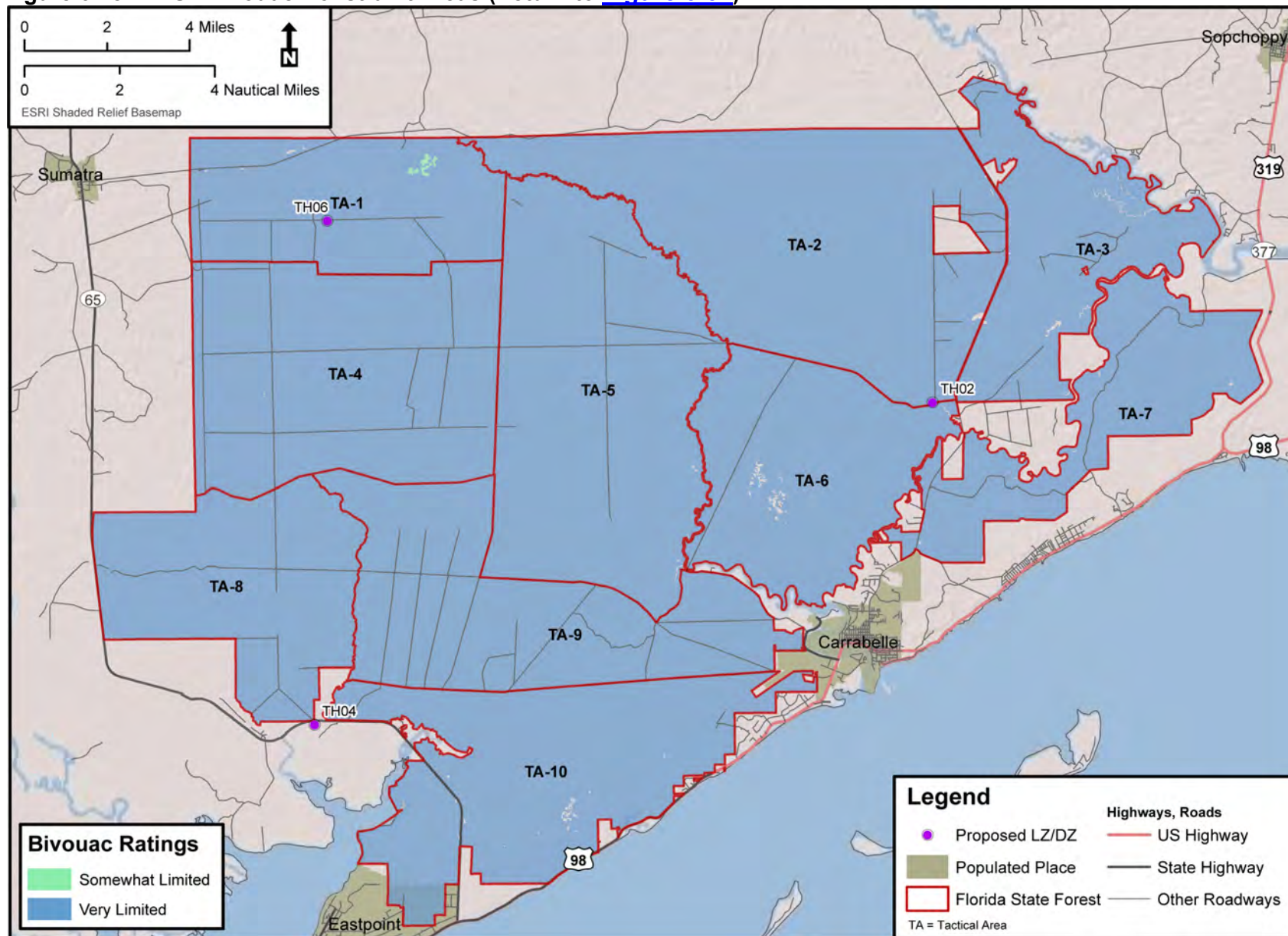


Figure 6-29. THSF Helicopter Landing Zone Constraint Areas (Return to [Figure 6-38](#))

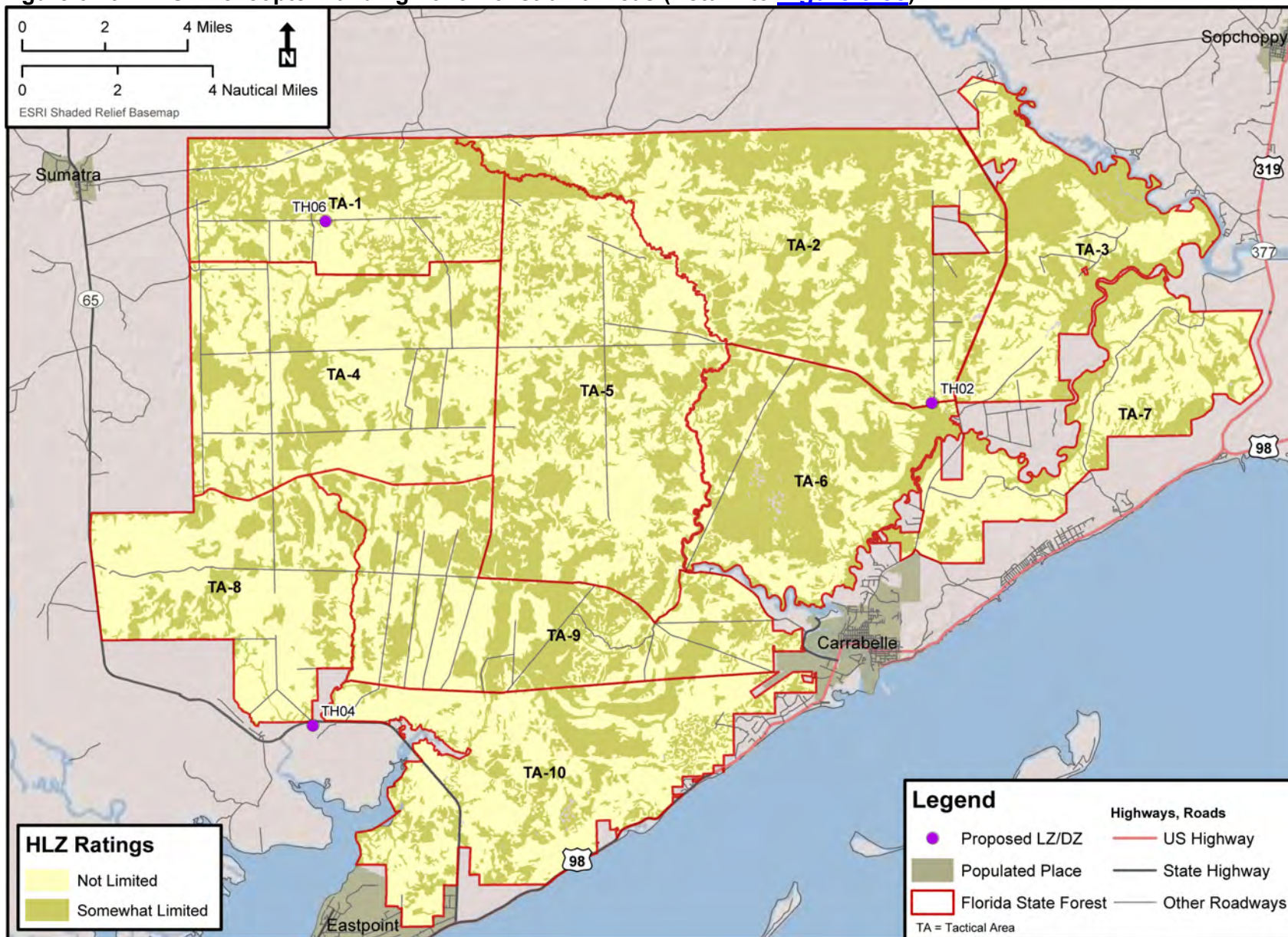




Figure 6-39. LZ/DZ Constraint Areas – TH2 (Return to [Figure 6-39](#))

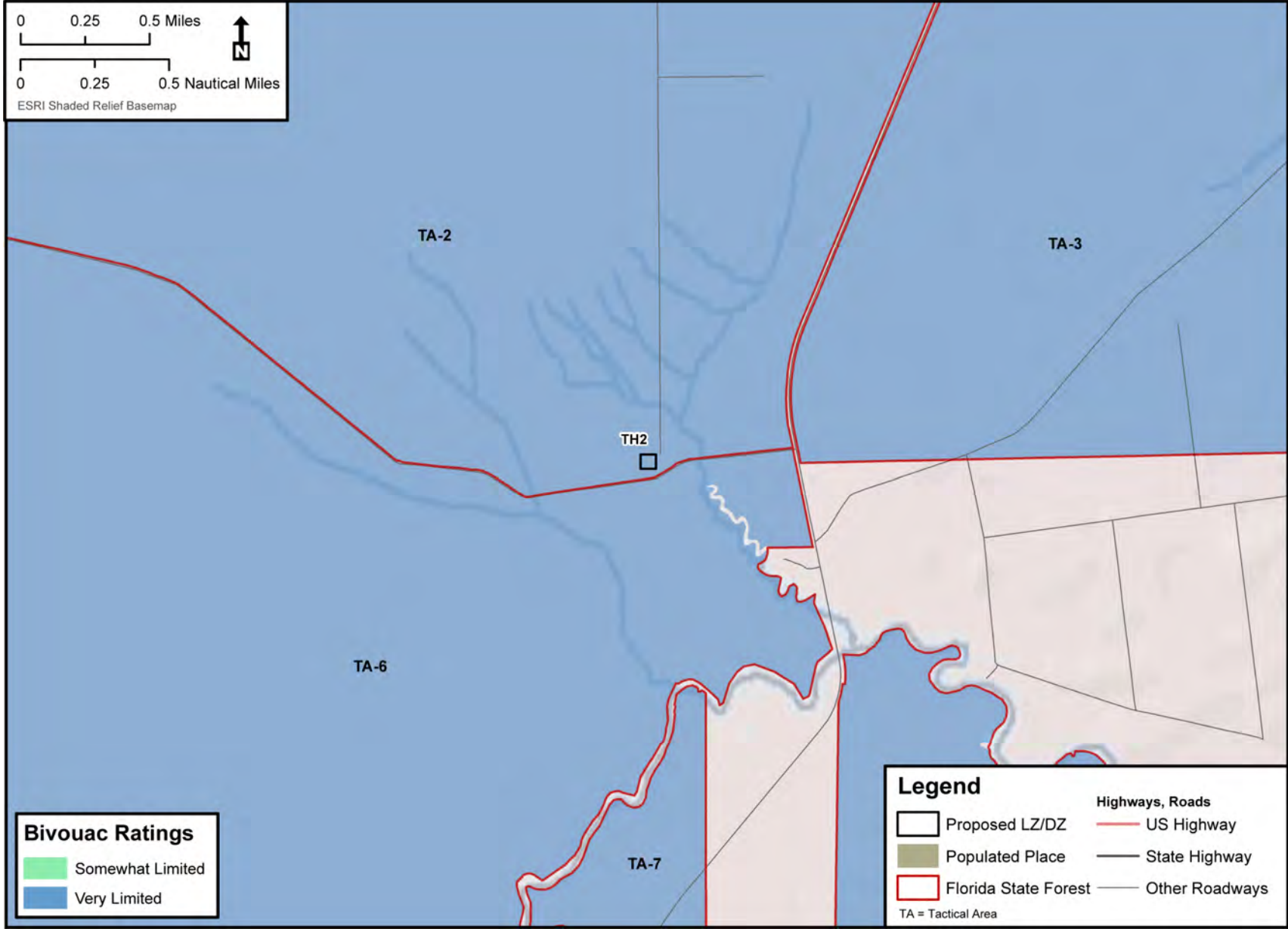


Figure 6-40. LZ/DZ Constraint Areas – TH4 (Return to [Figure 6-40](#))

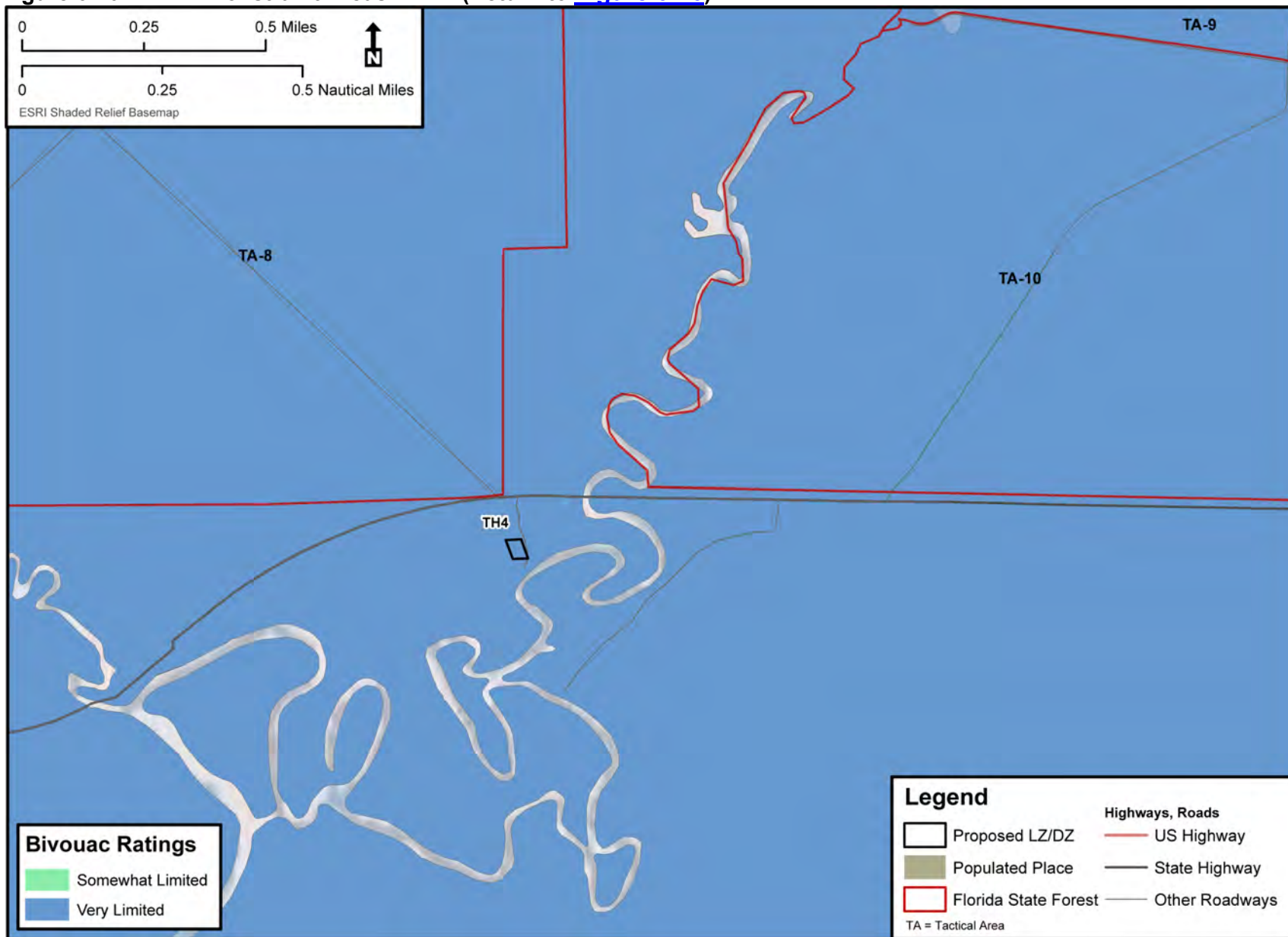


Figure 6-41. LZ/DZ Constraint Areas – TH6 (Return to [Figure 6-41](#))

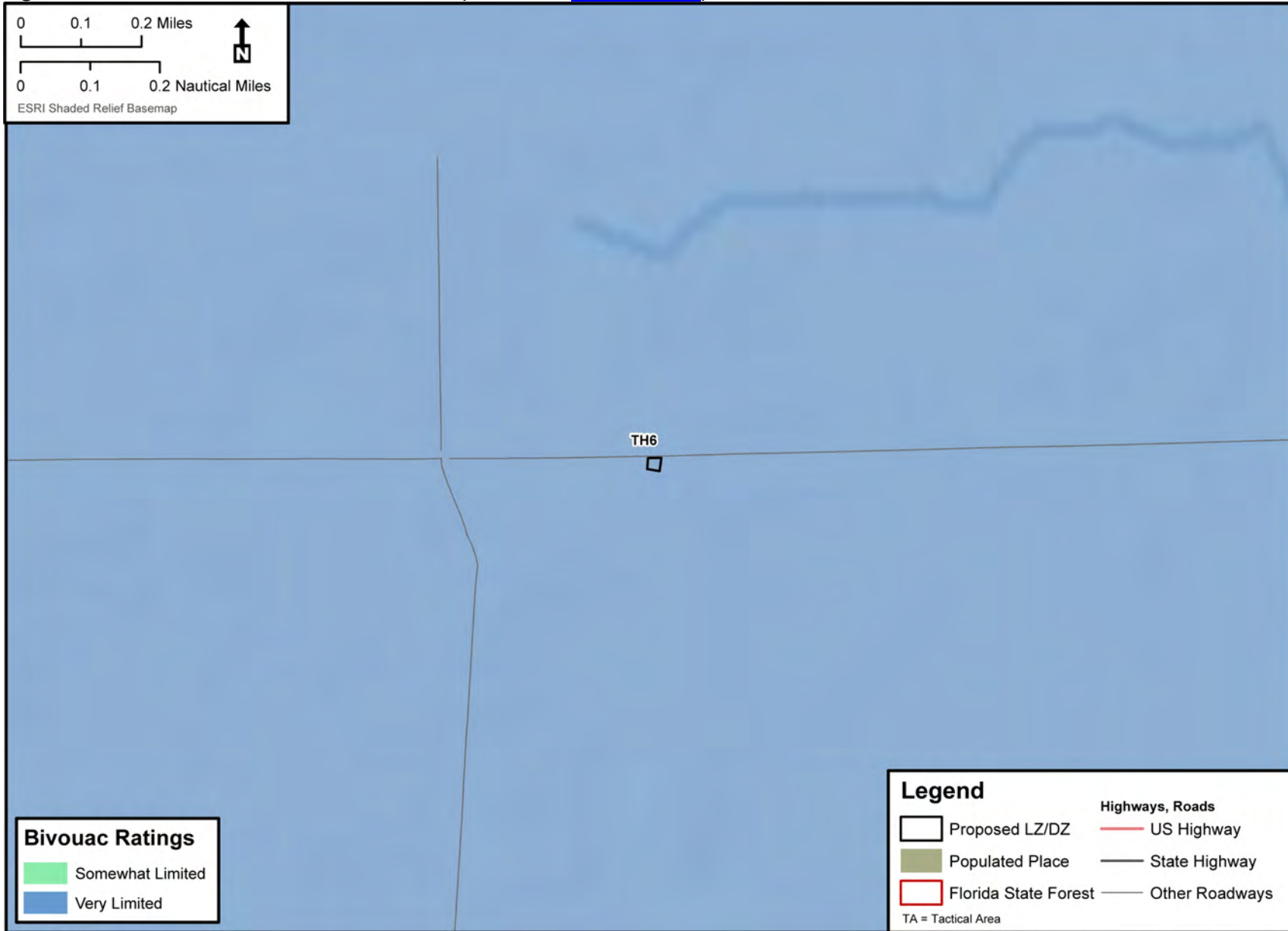
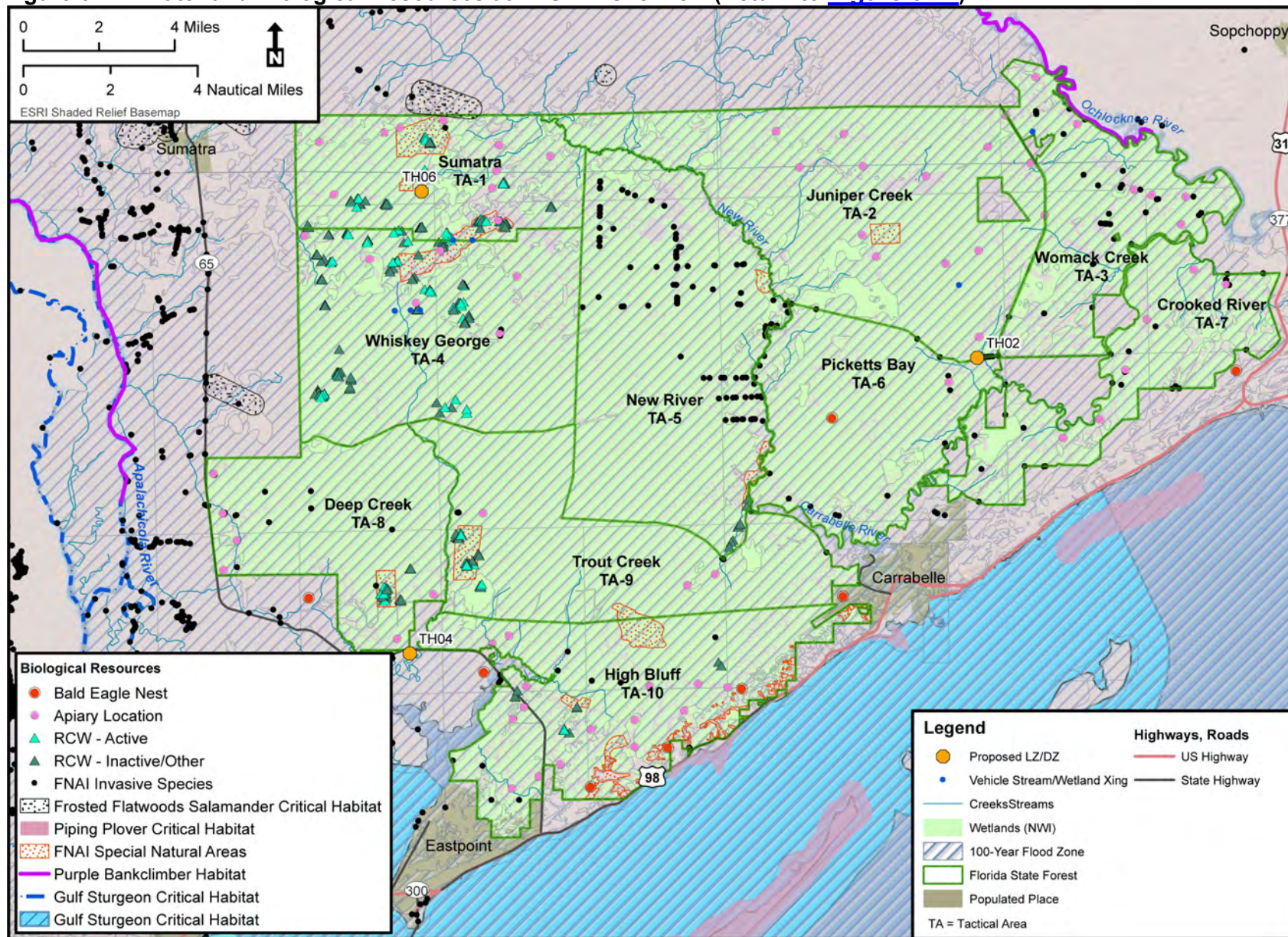


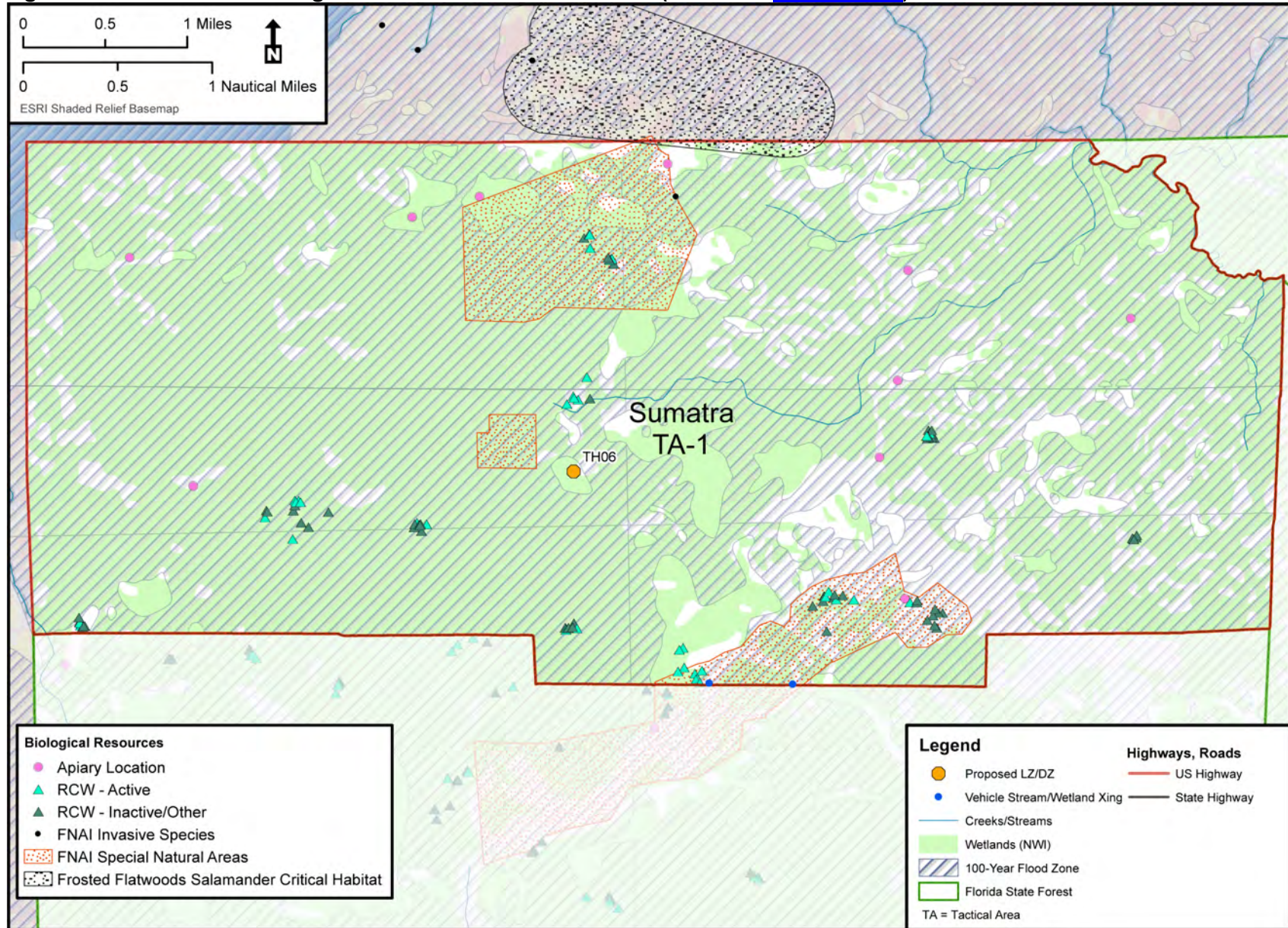


Figure 6-42. Water and Biological Resources at THSF – Overview (Return to [Figure 6-42](#))





**Figure 6-43. Water and Biological Resources – TA-1 at THSF (Return to [Figure 6-43](#))**





The map displays the proposed Juniper Creek Tactical Area (TA-2) in a green hatched pattern. It includes a scale bar (0 to 1.5 miles and 0 to 1.5 nautical miles) and a north arrow. A legend identifies various features: Proposed LZ/DZ (orange circle), Vehicle Stream/Wetland Xing (blue dot), Creeks/Streams (blue line), Wetlands (NWI) (light green), 100-Year Flood Zone (blue hatched), Florida State Forest (green outline), and State Highway (black line). Biological resources are marked with pink dots (Apiary Location), green triangles (RCW - Inactive/Other), black dots (FNAI Invasive Species), and orange hatched areas (FNAI Special Natural Areas). The map also shows the New River, Juniper Creek, and the location of TH02. The text 'TA = Tactical Area' is at the bottom left.



**Figure 6-45. Water and Biological Resources – TA-3 at THSF (Return to [Figure 6-45](#))**

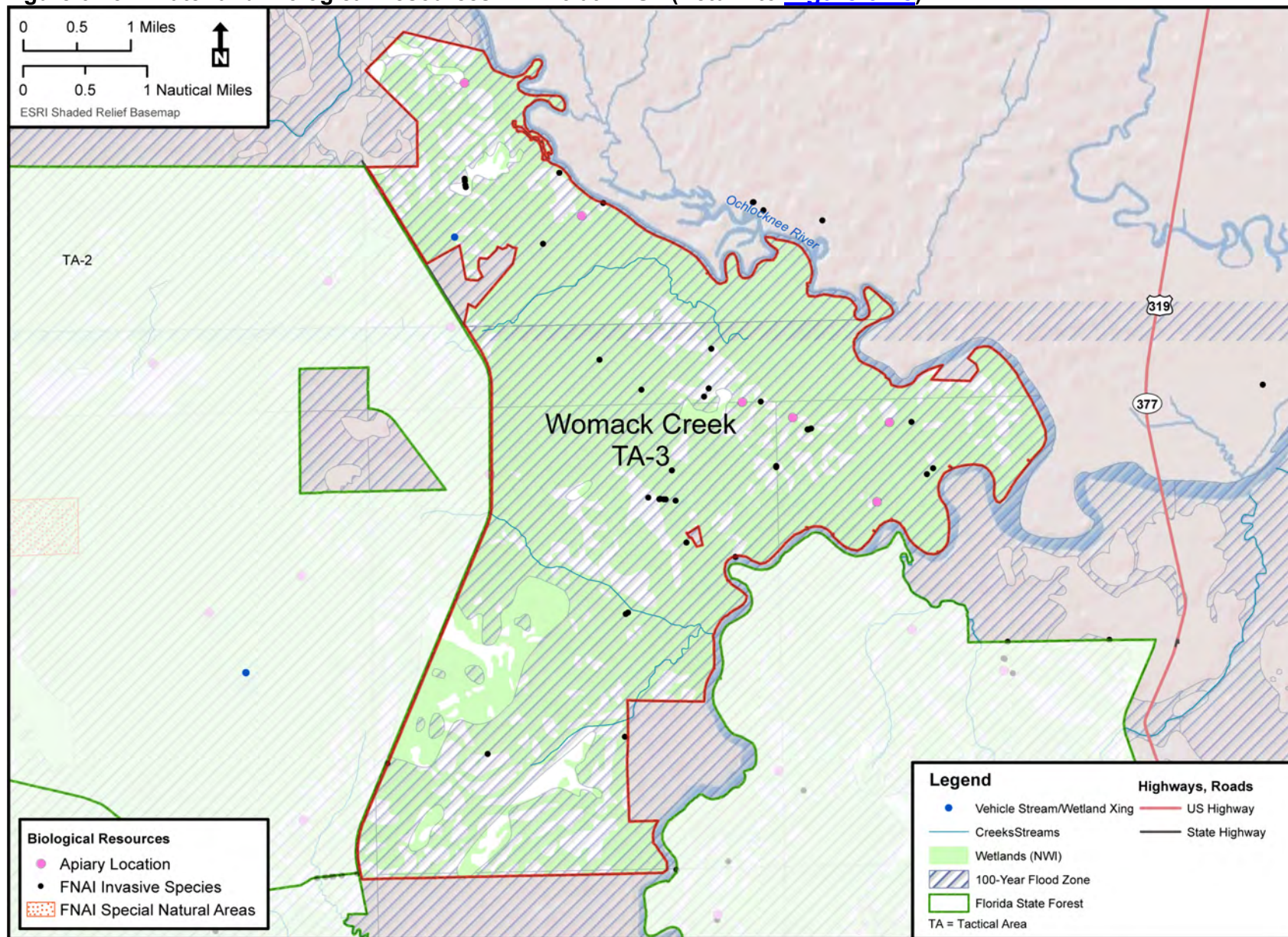
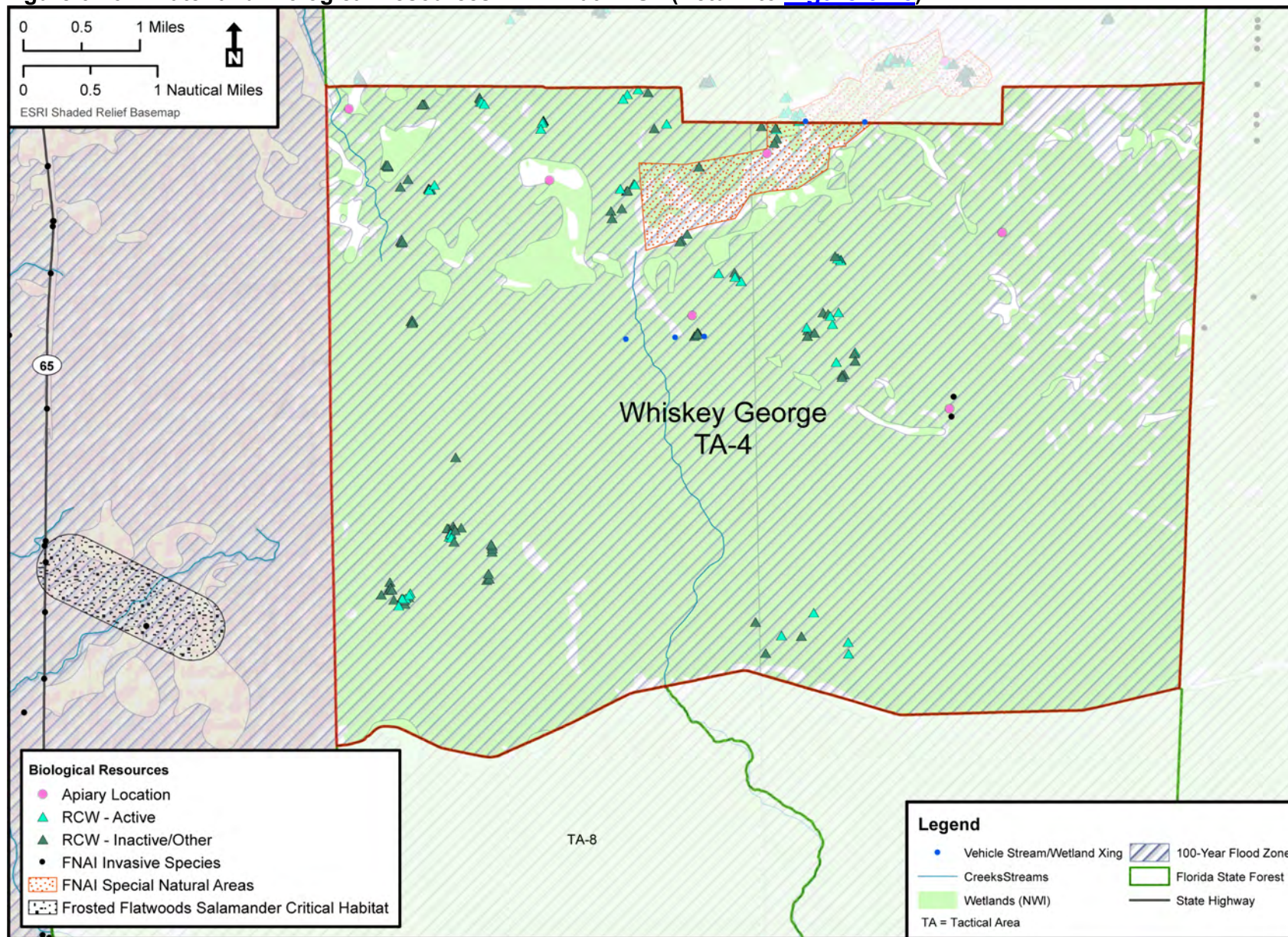




Figure 6-46. Water and Biological Resources – TA-4 at THSF (Return to [Figure 6-46](#))





**Figure 6-47. Water and Biological Resources – TA-5 at THSF (Return to [Figure 6-47](#))**

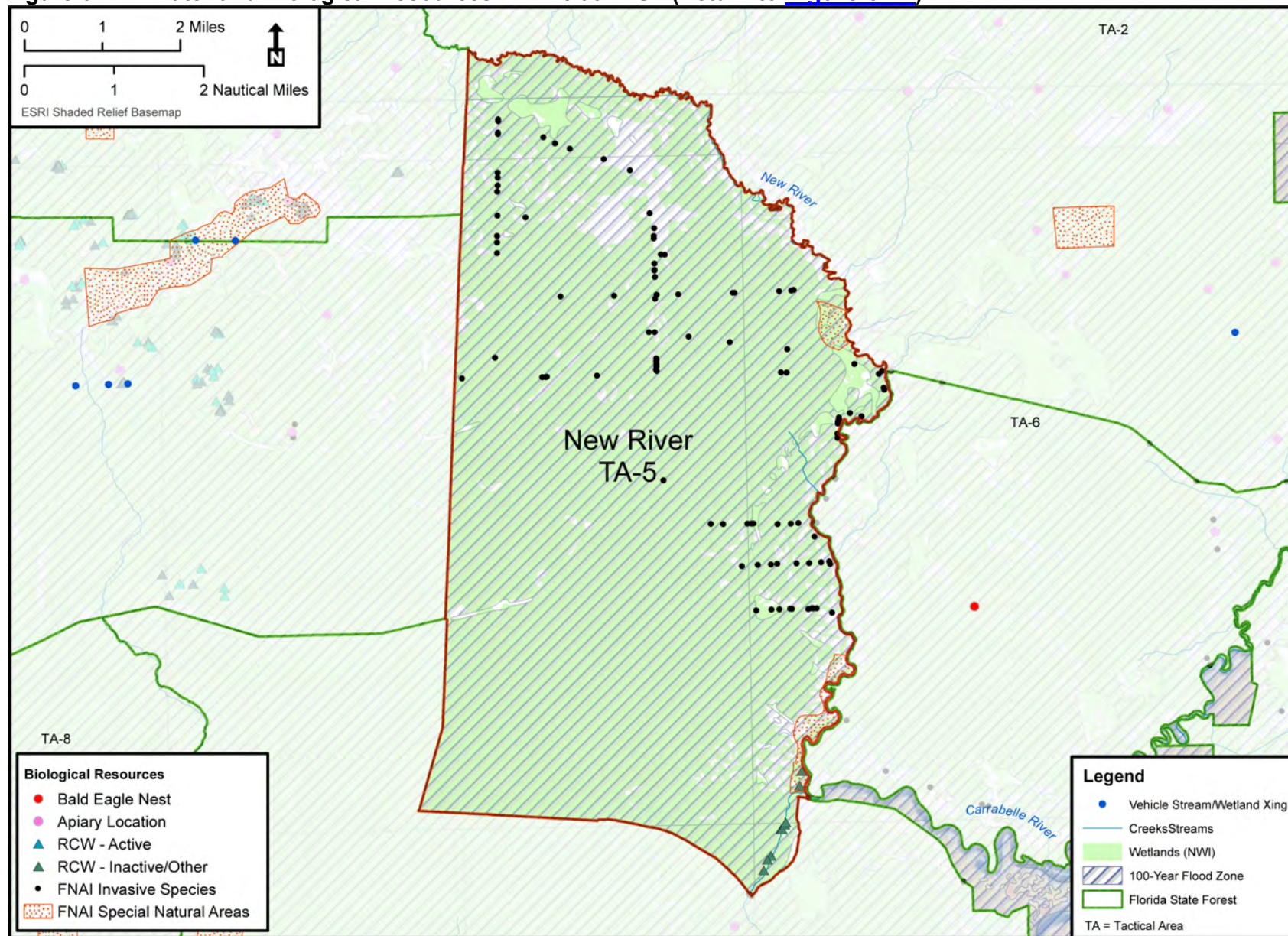
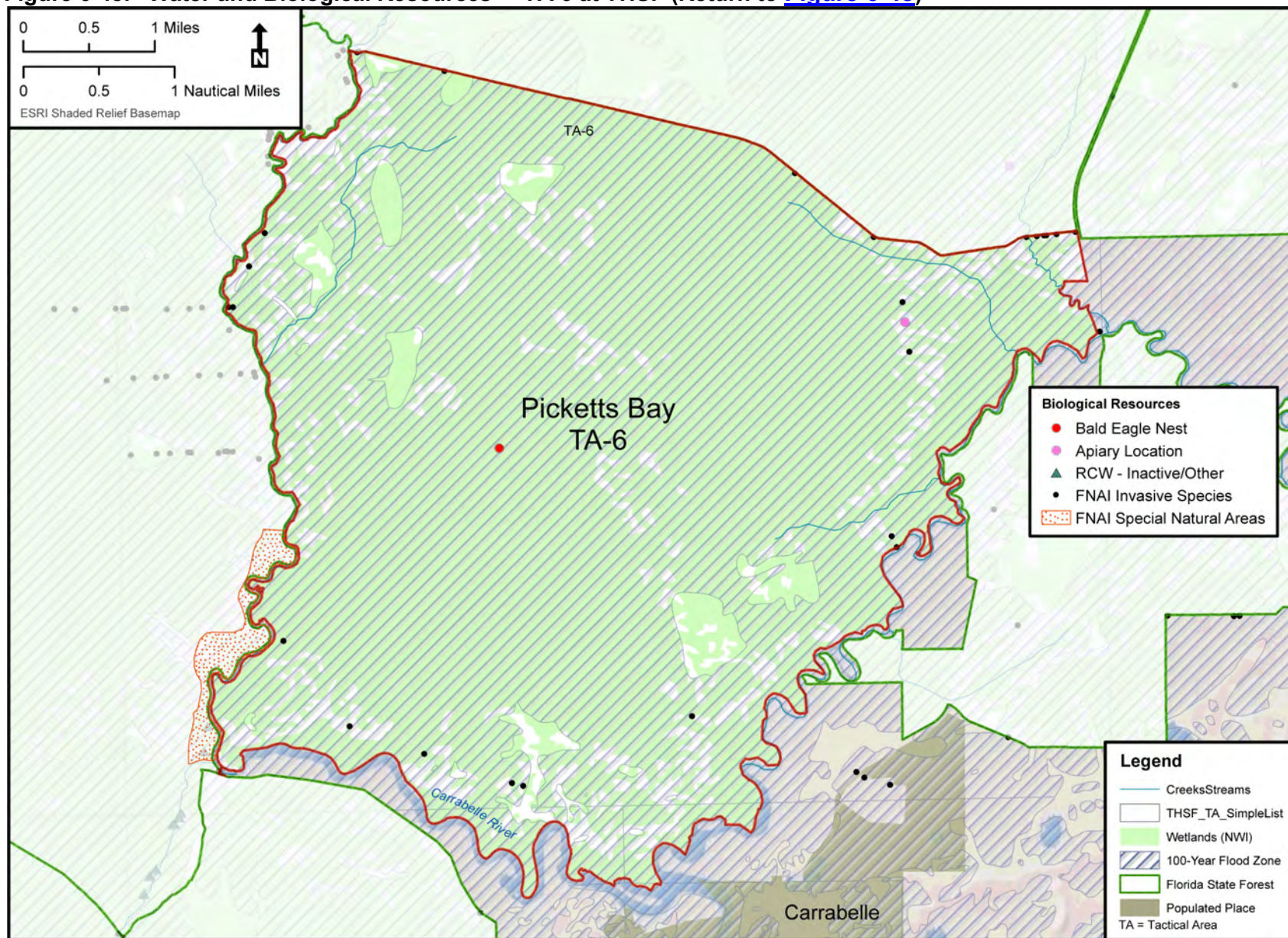




Figure 6-48. Water and Biological Resources – TA-6 at THSF (Return to [Figure 6-48](#))





**Figure 6-49. Water and Biological Resources – TA-7 at THSF (Return to [Figure 6-49](#))**

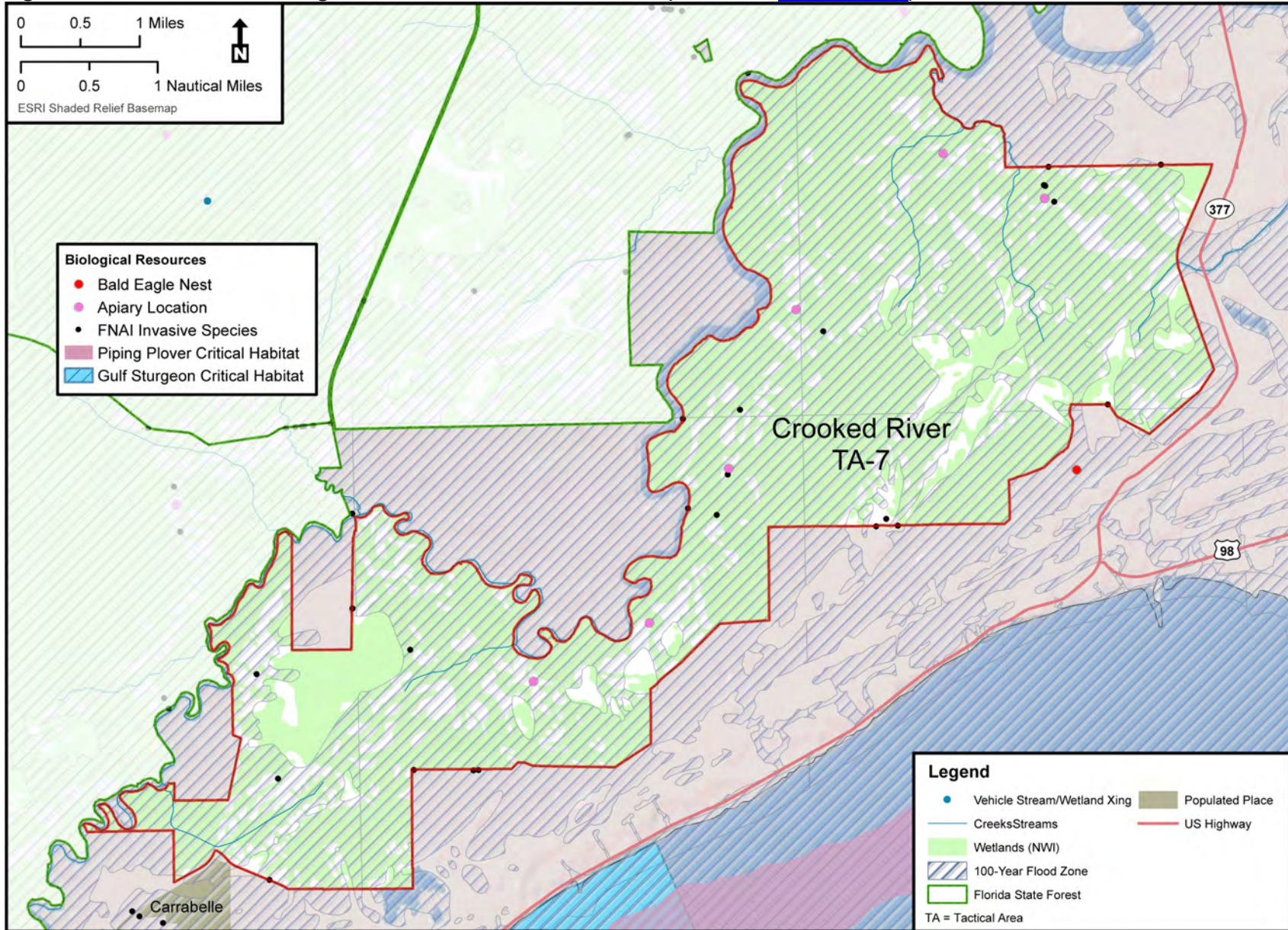
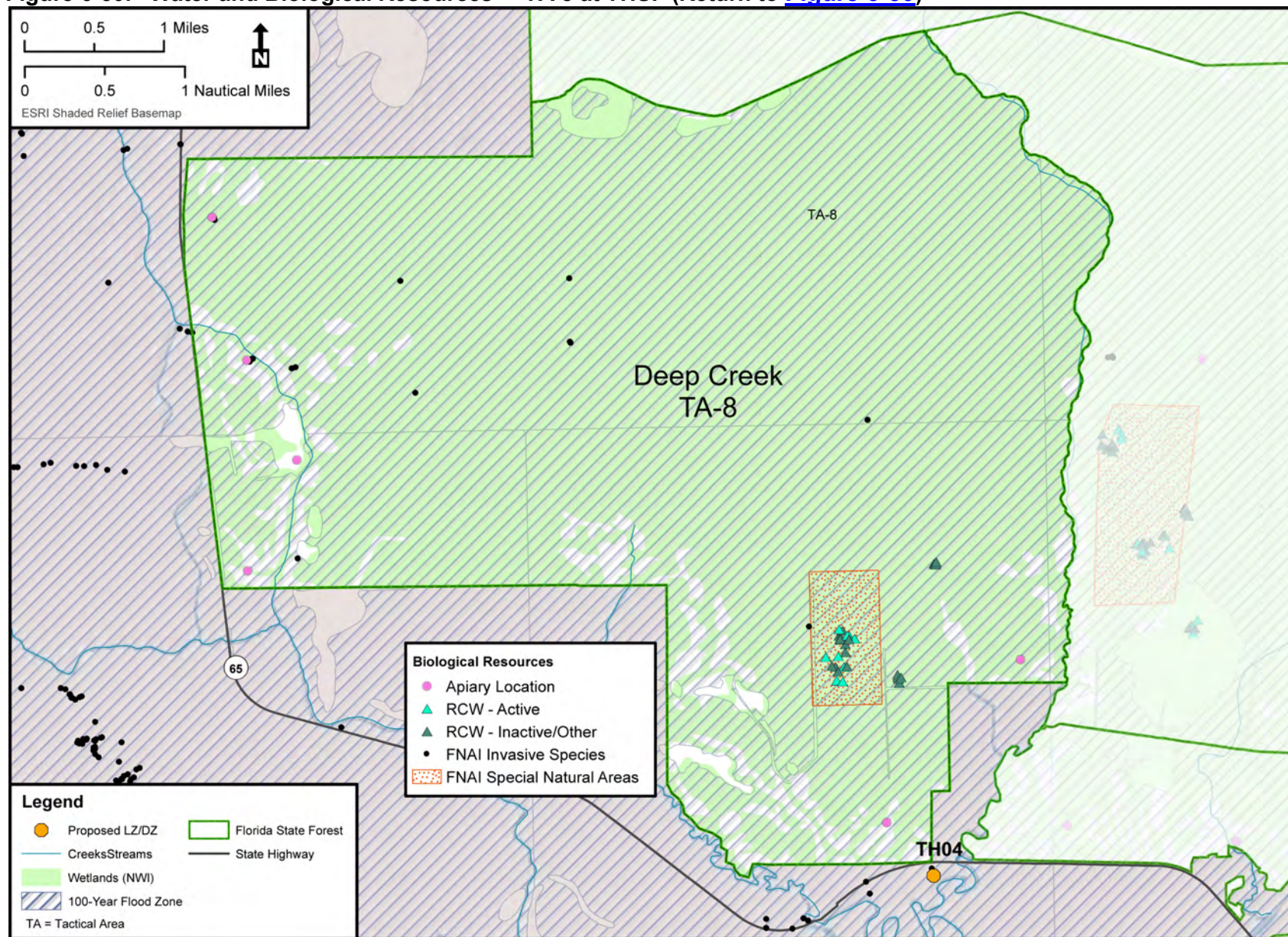




Figure 6-50. Water and Biological Resources – TA-8 at THSF (Return to [Figure 6-50](#))





**Figure 6-51. Water and Biological Resources – TA-9 at THSF (Return to [Figure 6-51](#))**

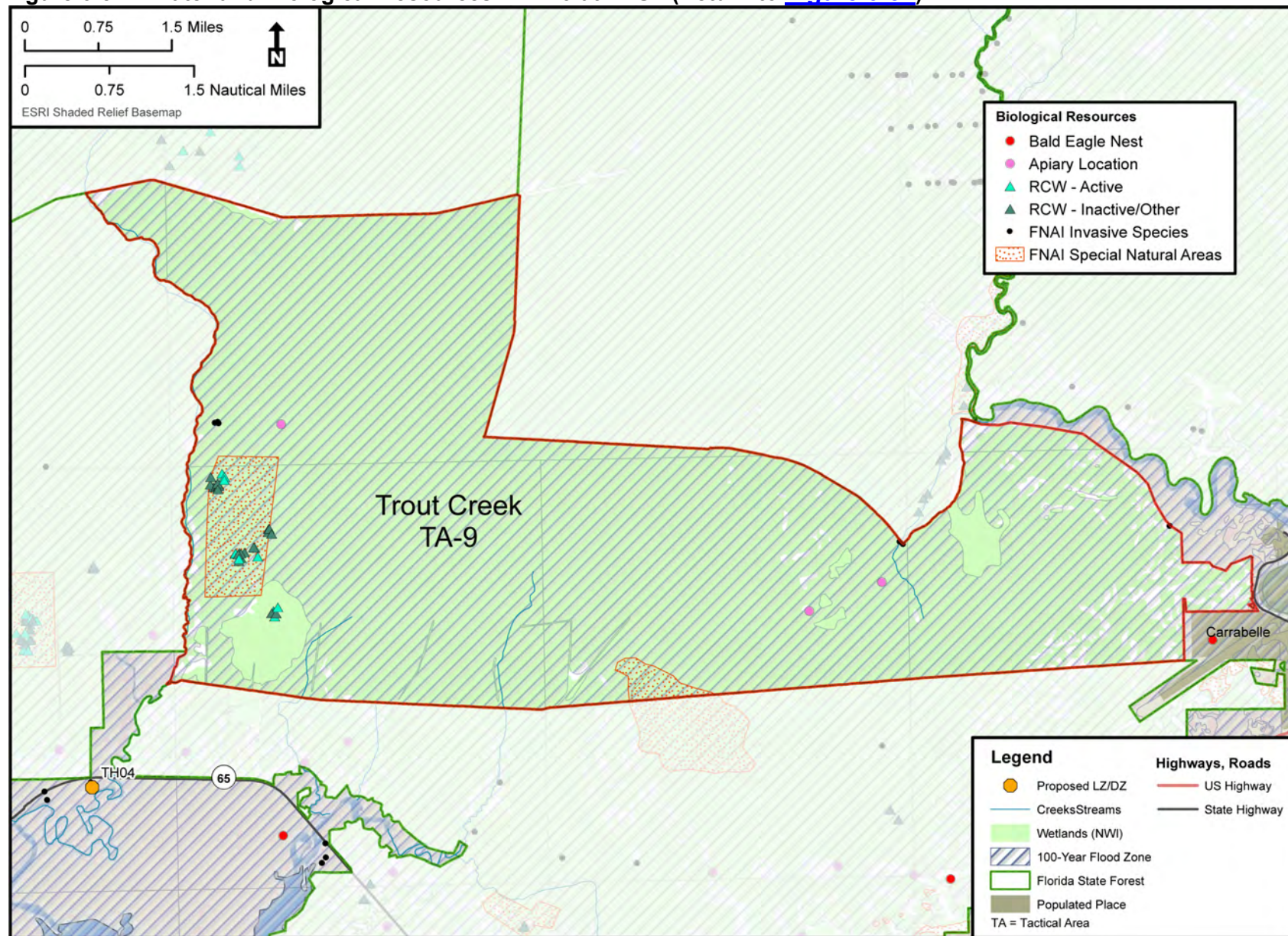




Figure 6-52. Water and Biological Resources – TA-10 at THSF (Return to [Figure 6-52](#))

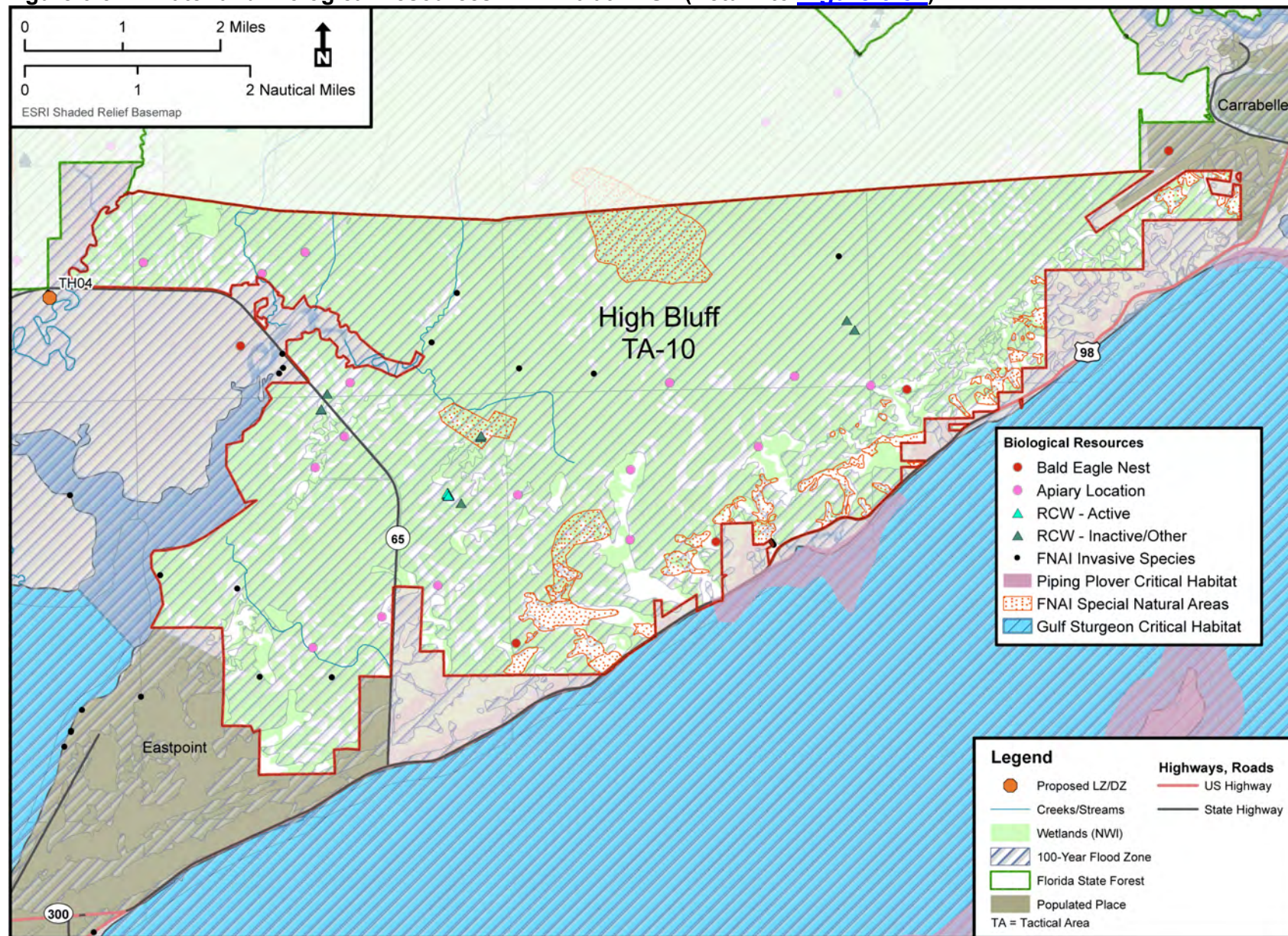




Figure 6-53. THSF Water and Biological Resources – TH2 (Return to [Figure 6-53](#))

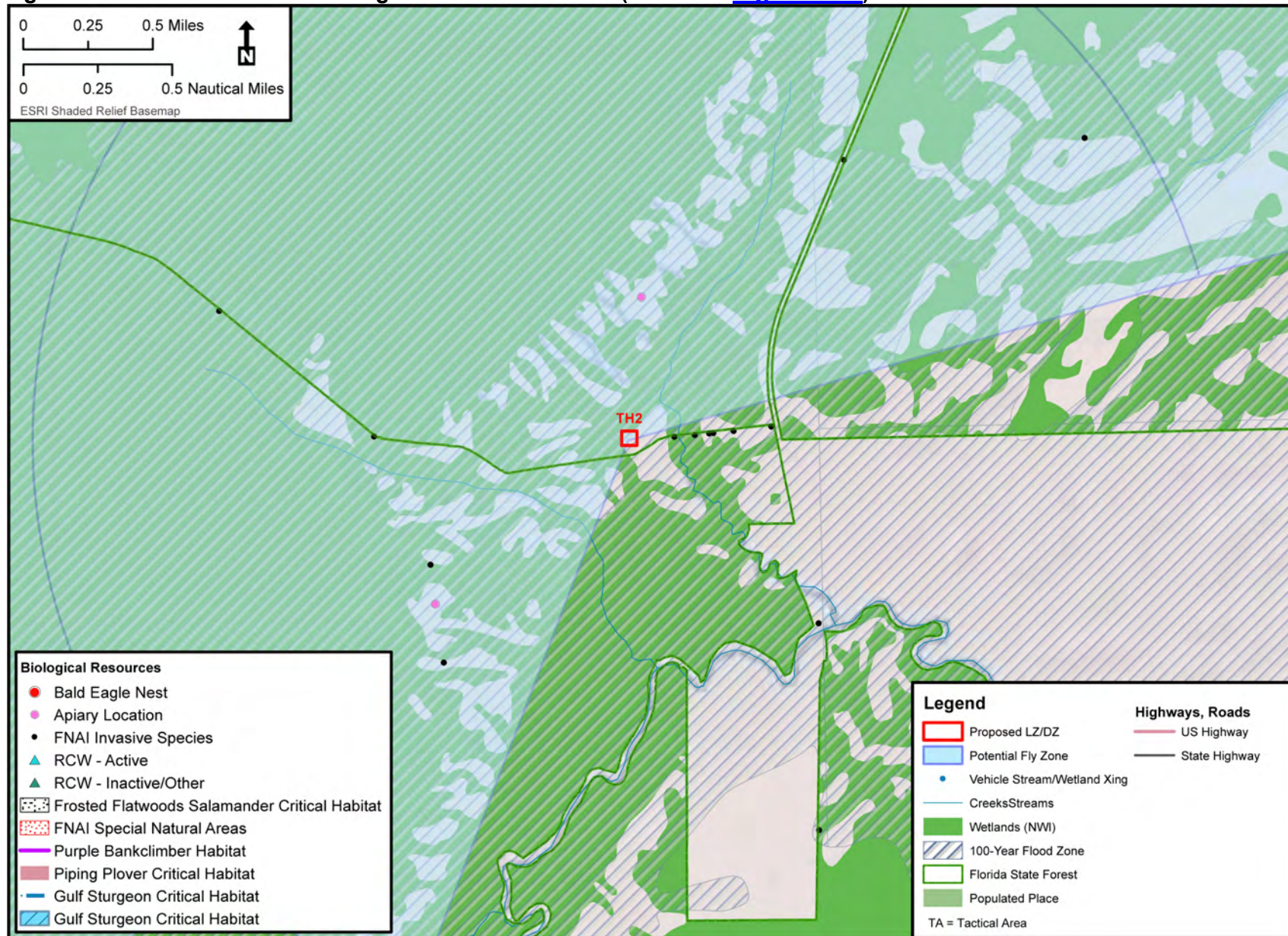
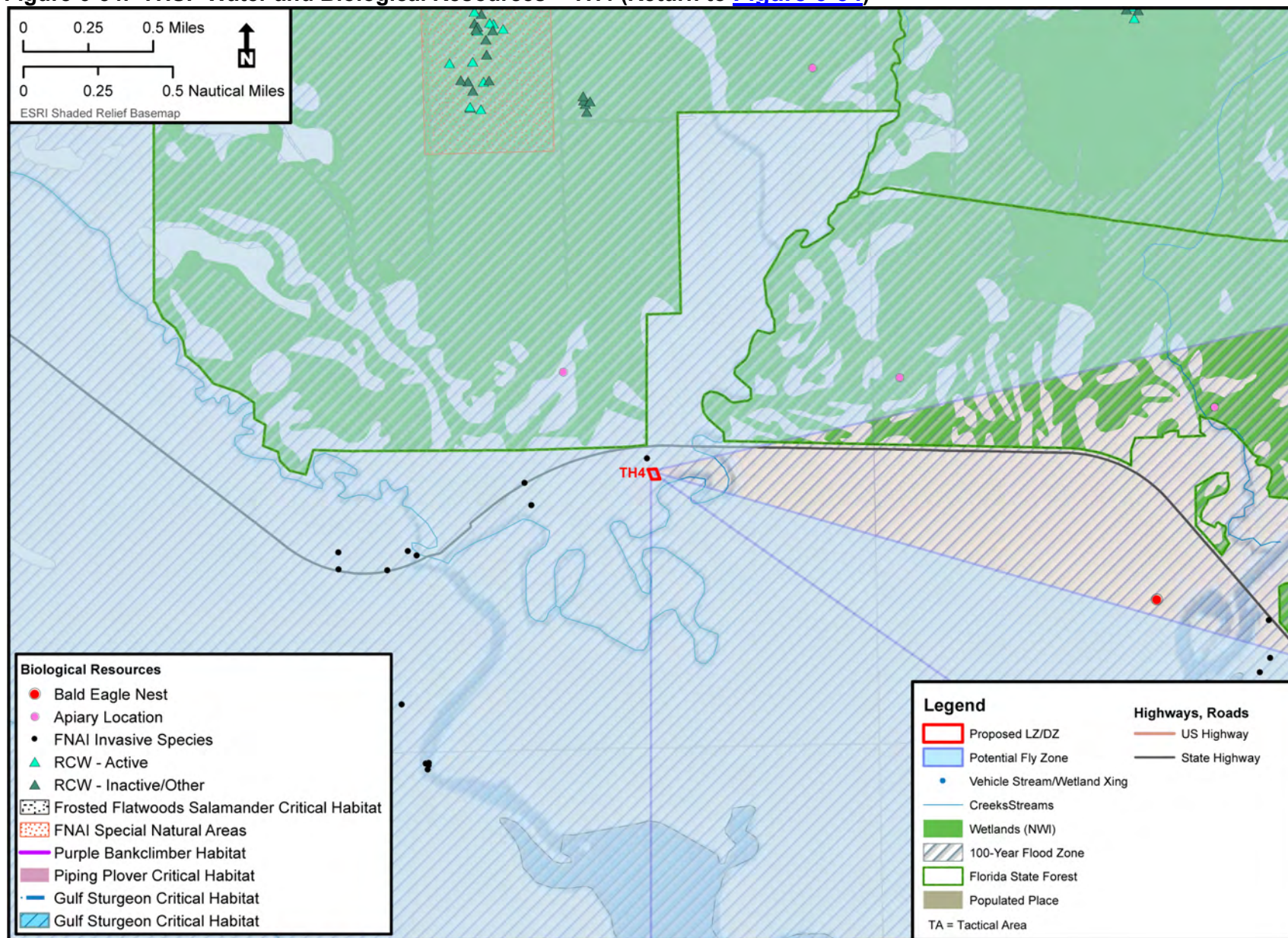




Figure 6-54. THSF Water and Biological Resources – TH4 (Return to [Figure 6-54](#))





**Figure 6-55. THSF Water and Biological Resources – TH6 (Return to [Figure 6-55](#))**

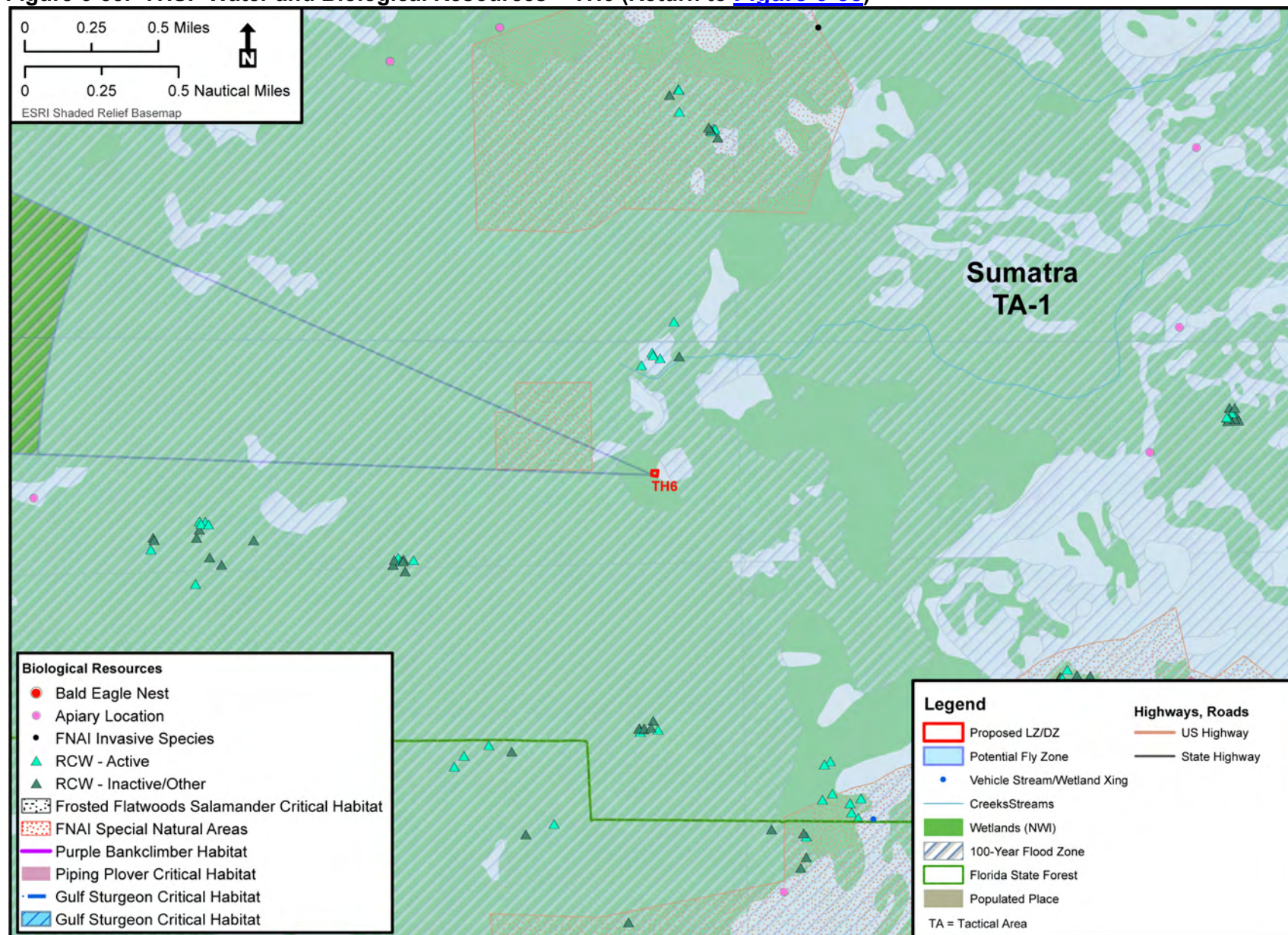




Figure 6-56. Cultural Resource Survey in THSF (Return to [Figure 6-56](#))

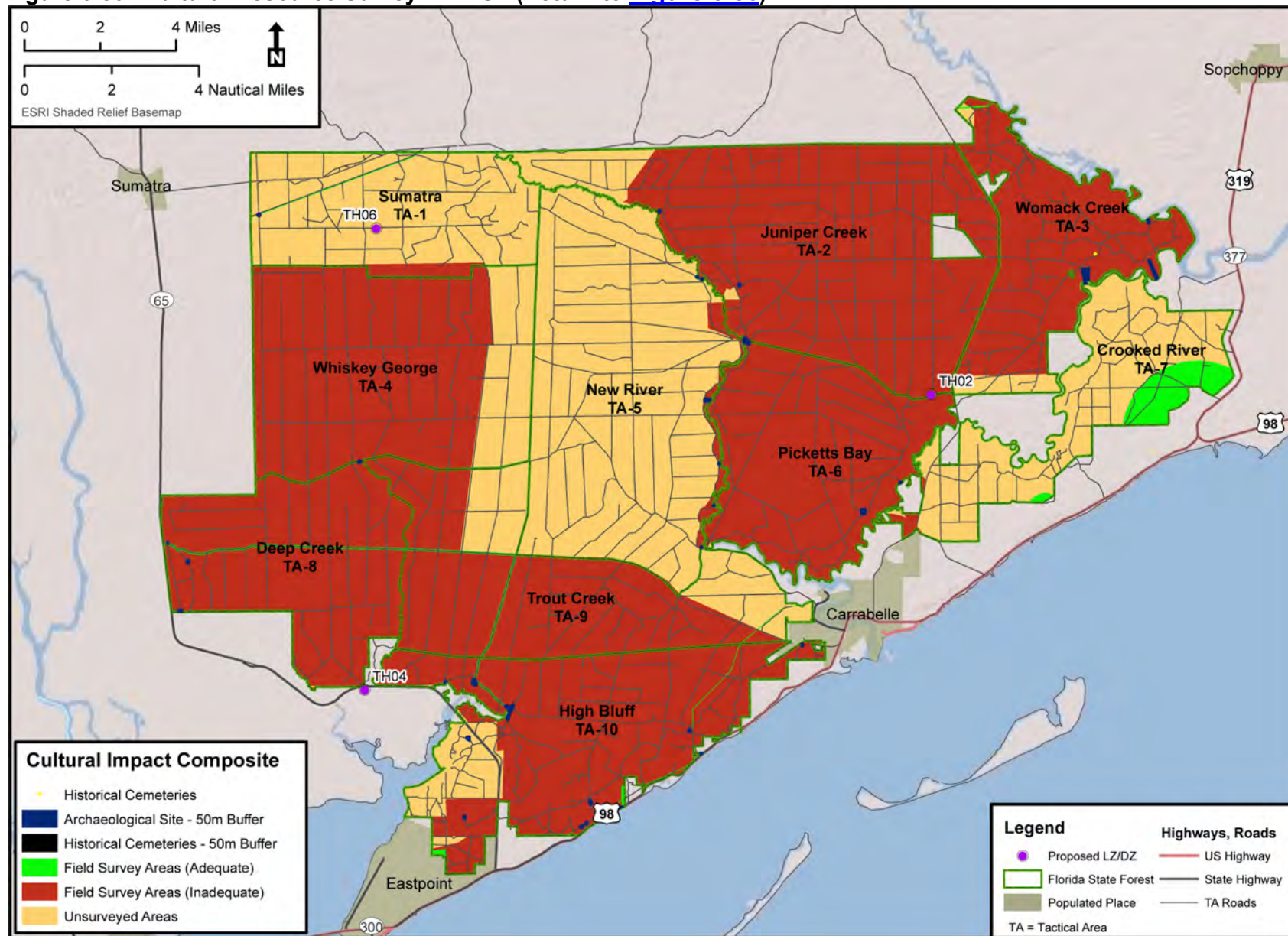




Figure 6-57. Generalized Land Use Types at THSF (Return to [Figure 6-57](#))

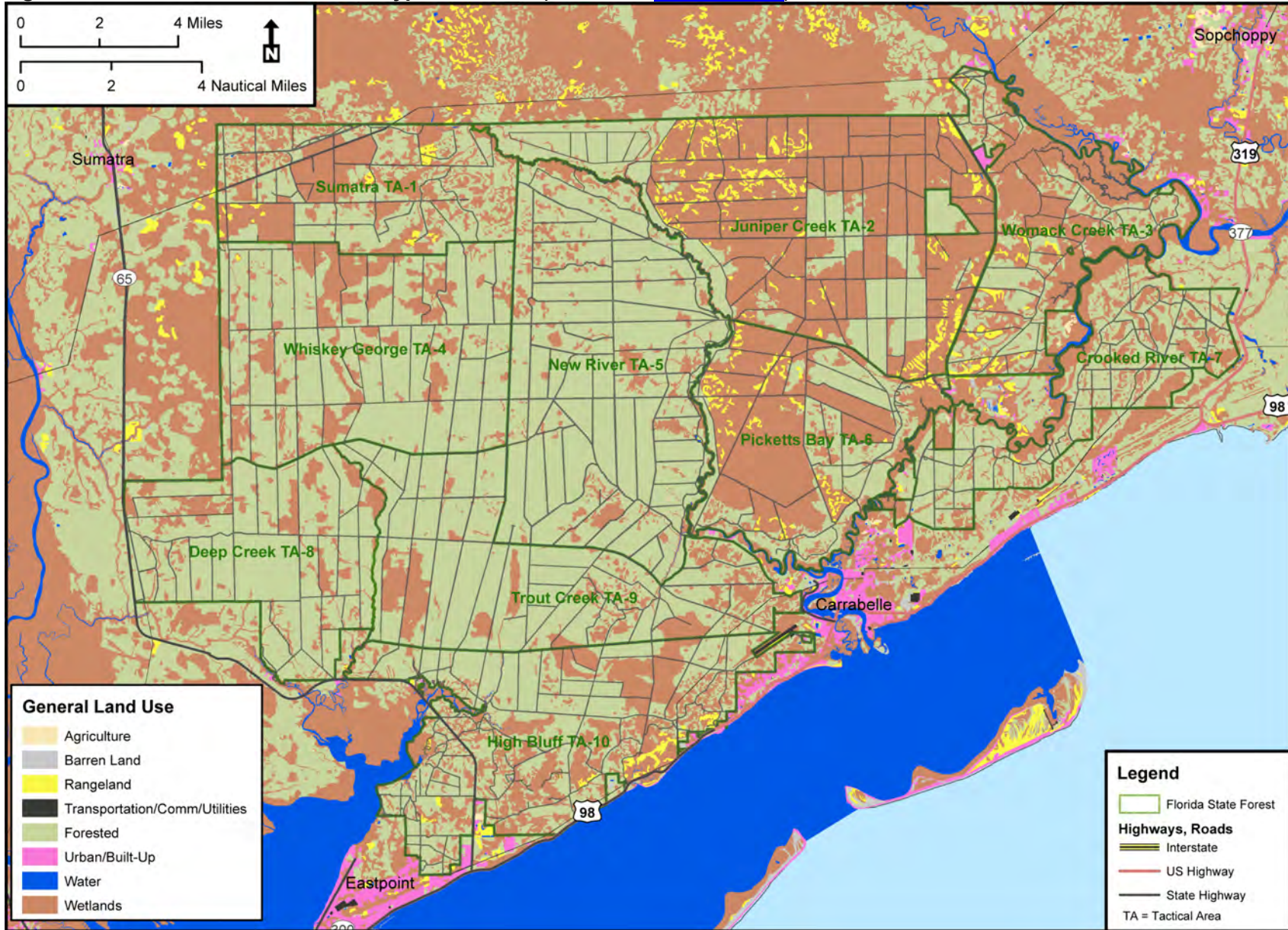




Figure 6-58. THSF Recreation and Hunting Areas (Return to [Figure 6-58](#))

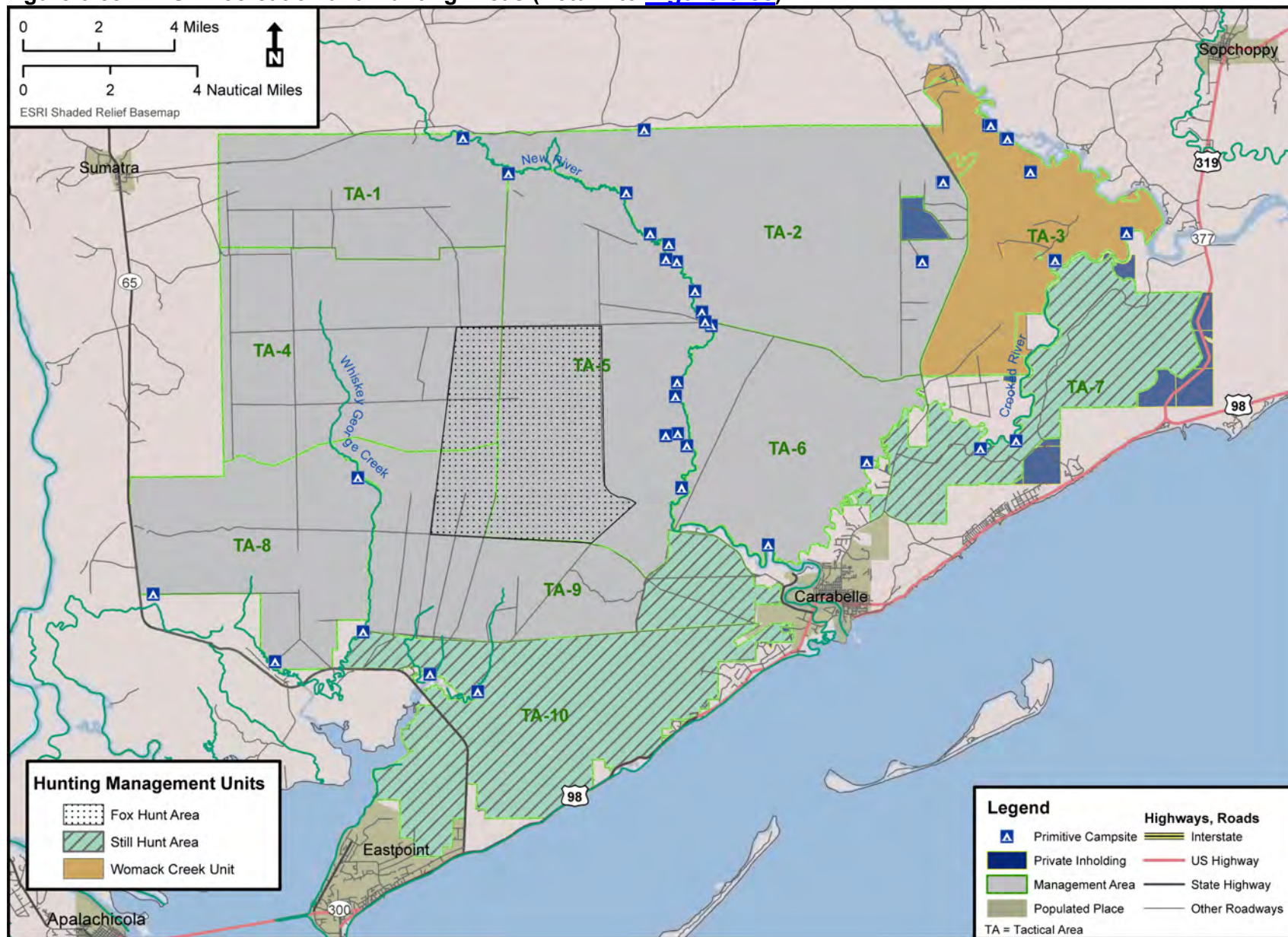




Figure 6-59. Environmental Justice Areas of Concern Near THSF (Return to [Figure 6-59](#))

